



US Army Corps  
of Engineers  
Waterways Experiment  
Station

# Environmental Characterization for the Sense and Destroy Armor (SADARM) Captive Flight Test, U.S. Army Yuma Proving Ground, Arizona, September 1990

by John O. Curtis, Flynn A. Clark  
Environmental Laboratory

Frank E. Perron, Jr., John E. Fiori,  
Bryan G. Harrington, Stephen N. Decato  
Cold Regions Research and Engineering Laboratory



Approved For Public Release; Distribution Is Unlimited

93-14996



93

6

30

002

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.



PRINTED ON RECYCLED PAPER

# Environmental Characterization for the Sense and Destroy Armor (SADARM) Captive Flight Test, U.S. Army Yuma Proving Ground, Arizona, September 1990

by John O. Curtis, Flynn A. Clark  
Environmental Laboratory

U.S. Army Corps of Engineers  
Waterways Experiment Station  
3909 Halls Ferry Road  
Vicksburg, MS 39180-6199

Frank E. Perron, Jr., John E. Fiori,  
Bryan G. Harrington, Stephen N. Decato

Cold Regions Research and Engineering Laboratory  
Corps of Engineers  
Hanover, NH 03755-1290

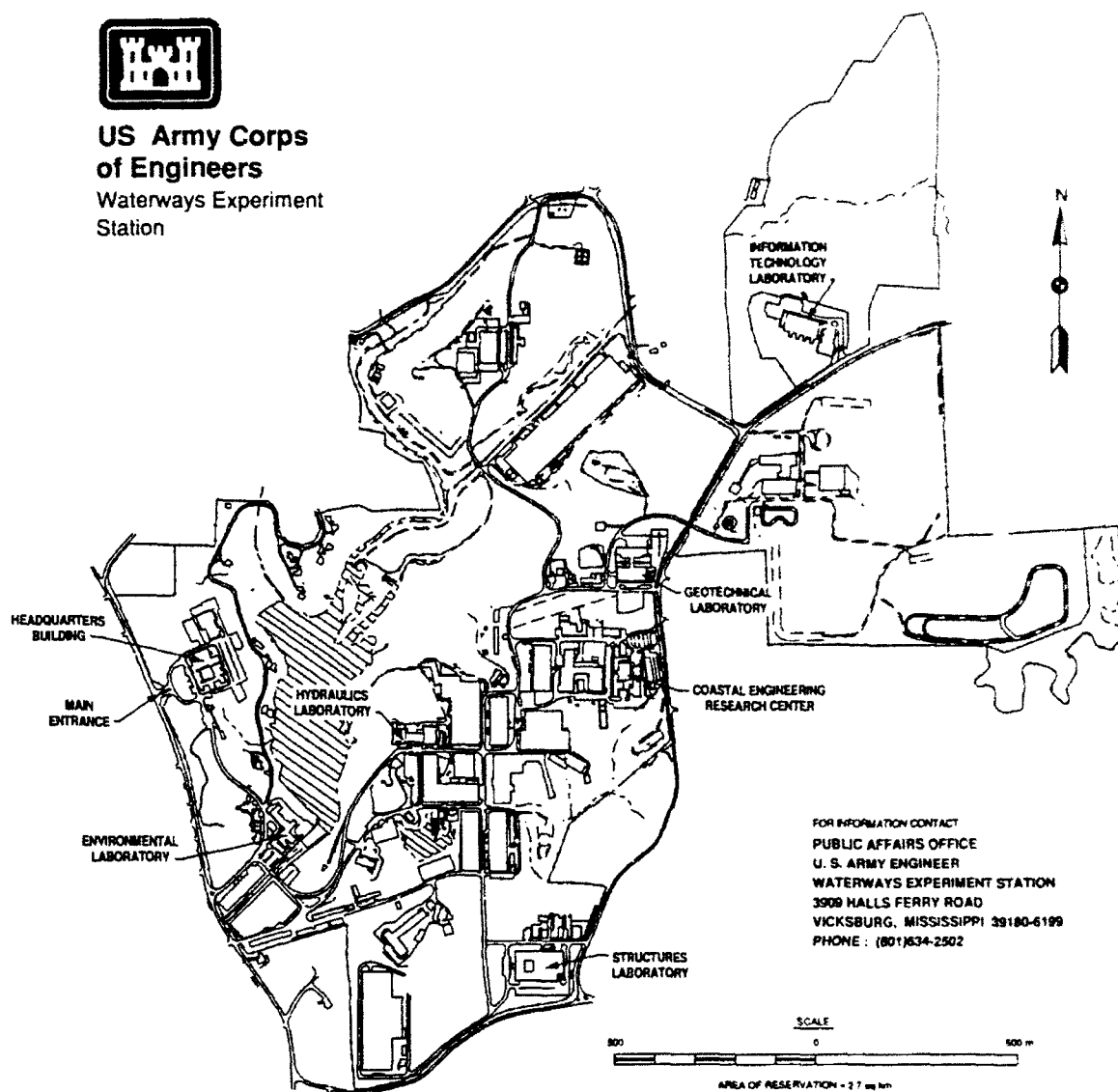
Accession For	
NTIS	CP 101 <input checked="" type="checkbox"/>
AD	AS <input checked="" type="checkbox"/>
Unpublished	<input type="checkbox"/>
By	
Distribution	
Availability Codes	
Dist	Avail and/or Special
A-1	

Final report

Approved for public release; distribution is unlimited



**US Army Corps  
of Engineers**  
Waterways Experiment  
Station



**Waterways Experiment Station Cataloging-in-Publication Data**

Environmental characterization for the Sense and Destroy Armor (SADARM) captive flight test, U.S. Army Yuma Proving Ground, Arizona, September 1990 / by John O. Curtis ... [et al.] ; prepared for U.S. Army Armament Research, Development and Engineering Center.

130 p. : ill. ; 28 cm. — (Miscellaneous paper ; EL-93-5)

Includes bibliographical references.

1. Remote sensing — Military aspects. 2. Military topography — Remote sensing. 3. Arid regions — Remote sensing — Military aspects. 4. Infrared imaging — Military aspects. I. Curtis, John O. II. Army Armament Research, Development, and Engineering Center (U.S.) III. U.S. Army Engineer Waterways Experiment Station. IV. Series: Miscellaneous paper (U.S. Army Engineer Waterways Experiment Station) ; EL-93-5.

TA7 W34m no.EL-93-5

# Contents

---

Preface . . . . .	vi
1—Introduction . . . . .	1
Background Information . . . . .	1
Objective of Study . . . . .	1
Scope of Report . . . . .	2
2—Data Collection Effort . . . . .	3
Control Site . . . . .	3
Observation Tower . . . . .	3
Overview of Measurements . . . . .	7
3—Boundary Layer Radiation Exchange Data . . . . .	9
Meteorological Information . . . . .	9
Soil Temperature Profiles . . . . .	10
4—Ground Surface Physical Properties and Characteristics . . . . .	13
General Description . . . . .	13
Soil Classification . . . . .	14
Moisture Content . . . . .	14
Control Site Topography . . . . .	14
5—Vegetation Characteristics . . . . .	20
General Description . . . . .	20
Species Identification . . . . .	20
Areal Densities . . . . .	20
Moisture Content . . . . .	23
6—Thermal Infrared Measurements . . . . .	24
Image Data . . . . .	24
Additional Measurements . . . . .	30
Simulated Rainfall Experiments . . . . .	33

7—Active Millimeter Wave Radar Measurements . . . . .	35
Measurement Procedure . . . . .	35
Preliminary Data Analysis . . . . .	39
Appendix A: Meteorological Data . . . . .	A1
Appendix B: Soil Temperature Profile Data . . . . .	B1
Appendix C: Soil Classification Data . . . . .	C1
Appendix D: Photographs of Dominant Plant Species . . . . .	D1
Appendix E: Photographs Depicting Thermal Infrared Image Views . . . . .	E1
Appendix F: Spot Measurement Thermal Infrared Data . . . . .	F1
SF 298	

## List of Figures

---

Figure 1. Control Site and SADARM test area locations . . . . .	4
Figure 2. Photograph mosaic of the Control Site . . . . .	5
Figure 3. Observation tower and instrumentation trailer . . . . .	7
Figure 4. Control Site meteorological tower . . . . .	9
Figure 5. Diurnal variation of solar loading and air temperature . . . . .	10
Figure 6. Soil pit being dug on the Control Site wash bank . . . . .	11
Figure 7. Representative wash bank soil temperature profiles . . . . .	11
Figure 8. Typical desert pavement . . . . .	15
Figure 9. Disturbed desert pavement . . . . .	15
Figure 10. Typical wash bottom material . . . . .	15
Figure 11. Gravimetric moisture contents for desert pavement . . . . .	17
Figure 12. Gravimetric moisture contents for wash bottom gravelly sands . . . . .	17
Figure 13. Gravimetric moisture contents for wash bank silt . . . . .	18
Figure 14. Control Site topography . . . . .	19
Figure 15. Secondary wash sample site at the SADARM test area . . . . .	21
Figure 16. Ambient air temperature blackbody . . . . .	24
Figure 17. Two passive blackbody metal calibration plates . . . . .	25
Figure 18. Control Site, scene 4 imagery . . . . .	27

Figure 19.	Photograph of the spot temperature measurement site . . .	31
Figure 20.	Temporal variation in radiometric temperature for wash gravel . . . . .	31
Figure 21.	K <sub>a</sub> -band scatterometer on top of the observation tower . .	36
Figure 22.	Close-up view of the scatterometer . . . . .	36
Figure 23.	Scatterometer scan pattern . . . . .	37
Figure 24.	Representative RCS map of the Control Site . . . . .	41

## List of Tables

---

Table 1.	SADARM Test Area and Control Site Vegetation Species . . . . .	20
Table 2.	Vegetation Sample Site Areas . . . . .	21
Table 3.	Vegetation Areal Density Summary . . . . .	23
Table 4.	Summary of Average Plant Moisture Contents . . . . .	23
Table 5.	Summary of Thermal Infrared Imagery . . . . .	26
Table 6.	Terrain Features Examined by the Staring Radiometers . .	30
Table 7.	Soil Moisture Measurements Supporting the Simulated Rainfall Experiments . . . . .	34
Table 8.	Summary of Scatterometer Data Collected at YPG . . . .	38
Table 9.	Representative Backscatter Coefficient Calculations . . .	40

# Preface

---

The study reported herein was conducted by the U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, MS, and the Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH. It was funded by the U.S. Army Armament Research, Development and Engineering Center, Picatinny Arsenal, New Jersey.

This report was prepared by Dr. John O. Curtis, Mr. Flynn A. Clark, Environmental Systems Division (ESD), Environmental Laboratory (EL), WES, and Messrs. Frank E. Perron, Jr., John E. Fiori, Bryan G. Harrington, and Stephen N. Decato, Geophysical Sciences Branch, Research Division, CRREL. Data was collected by personnel from WES and CRREL. Dr. Curtis headed the WES field team, and Mr. Perron headed the CRREL team.

The study was conducted under the general supervision of Dr. John Harrison, Director, EL, and Dr. Victor E. LaGarde, Chief, ESD.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Leonard G. Hassell, EN. COL Palmer K. Bailey, CE, was Commander of CRREL, and Dr. Lewis E. Link was Director.

This report should be cited as follows:

Curtis, J. O., Clark, F. A., Perron, F. E., Jr., Fiori, J. E., Harrington, B. G., and Decato, S. N. (1993). "Environmental characterization for the sense and destroy armor (SADARM) captive flight test, U.S. Army Yuma Proving Ground, Arizona, September 1990," Miscellaneous Paper EL-93- , U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.



# 1 Introduction

---

## Background Information

The Army's Sense And Destroy Armor (SADARM) system is a parachute-delivered antiarmor weapon system currently undergoing full-scale engineering development. The final system configuration will consist of a submunition whose firing from some altitude above the target will be triggered by onboard algorithms whose input will include data from sensors that operate in both the thermal infrared and millimeter wave portions of the electromagnetic spectrum.<sup>1</sup>

Prototype SADARM sensors have been tested under captive flight test conditions during various stages of their development by contractors competing for the production contract. The test program that took place at the U.S. Army Yuma Proving Ground (YPG) in September 1990 was one of a series of tests in desert environmental conditions. Overall SADARM system development responsibility lies within the Office of Project Manager, SADARM at the U.S. Army Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, New Jersey.

## Objective of Study

ARDEC asked the U.S. Army Corps of Engineers to conduct test site measurements sufficient to characterize the background near targets within the sensors fields of view during the YPG captive flight tests. These data included measurements to determine the impact of changing environmental conditions (e.g., time of day, meteorology, immediate climatological history) on background signatures. This study provides data that is not only immediately useful to ARDEC and its contractors, but also to the long-term

---

<sup>1</sup> Belcher, C. L., Richards, M. A., and Alexander, P. M. (1990). "Millimeter wave data reduction and analysis for support of system evaluation," Final Technical Report, Project A-8415, Georgia Institute of Technology, Atlanta, GA.

Corps of Engineers goal of developing and improving background signature models.

## **Scope of Report**

Following an introductory section on how the site characterization data collection effort was conducted, subsequent sections of this report provide more detail on specific data sets; namely, what was measured, what instruments were used, and, where appropriate, data samples and/or the results of some preliminary analyses.

## 2 Data Collection Effort

---

### Control Site

To avoid conflicts with activities within the actual SADARM test area, a nearby patch of terrain was selected for detailed characterization measurements (Figure 1). This area, hereafter referred to as the Control Site, was carefully chosen to be representative of the terrain contained within the SADARM test area, while at the same time being limited enough in extent to allow for meaningful terrain characterization measurements. The Control Site (Figure 2) contained most of the vegetation species that existed in the SADARM test area as well as a well-defined desert wash whose banks and gravel bottom could be easily viewed from the sensor platform described in the following paragraphs.

### Observation Tower

A platform from which the Control Site could be viewed at various depression angles was designed and assembled (Figure 3). Sensors positioned on this platform included two thermal infrared imaging systems, an active millimeter wave radar, and two millimeter wave radiometers. Safety concerns limited the height of the observation tower to about 10 m. Further concerns about the possibility of sudden flooding through the wash because of heavy rains forced the tower to be placed far enough up-slope from the wash banks to secure its footing.

Because of the safety factors discussed above, the resulting range of depression angles for viewing vegetation in the wash and other relevant wash features were limited to a range of 10 to 30 deg.<sup>1</sup> While these angles are not typical of SADARM sensor parameters, they are nevertheless the best compromise available. Furthermore, the surrounding desert pavement could be viewed at depression angles of as much as 70 deg.

---

<sup>1</sup> To convert degrees (angles) to radians, multiply by 0.1745329.

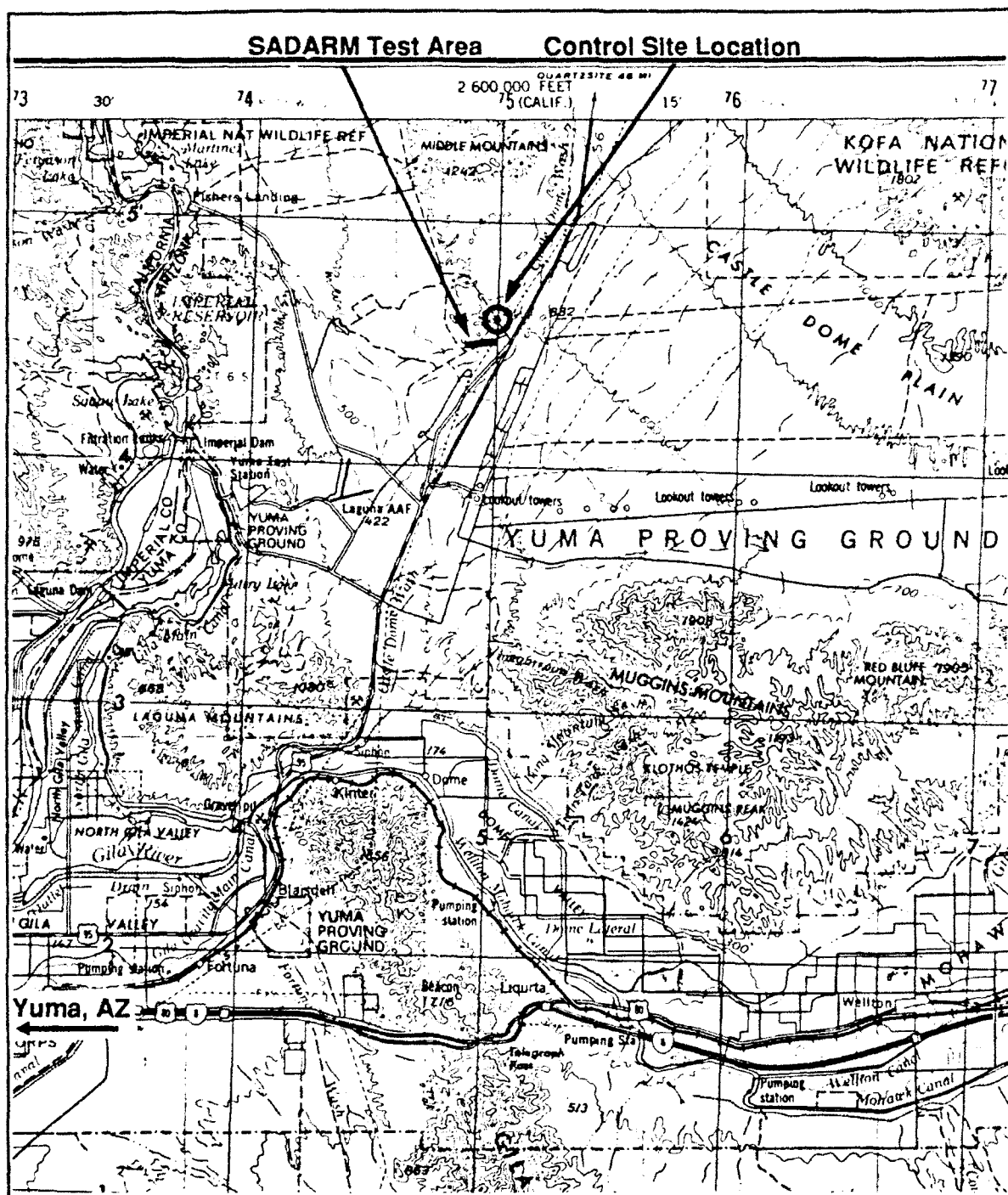


Figure 1. Control Site and SADARM test area locations

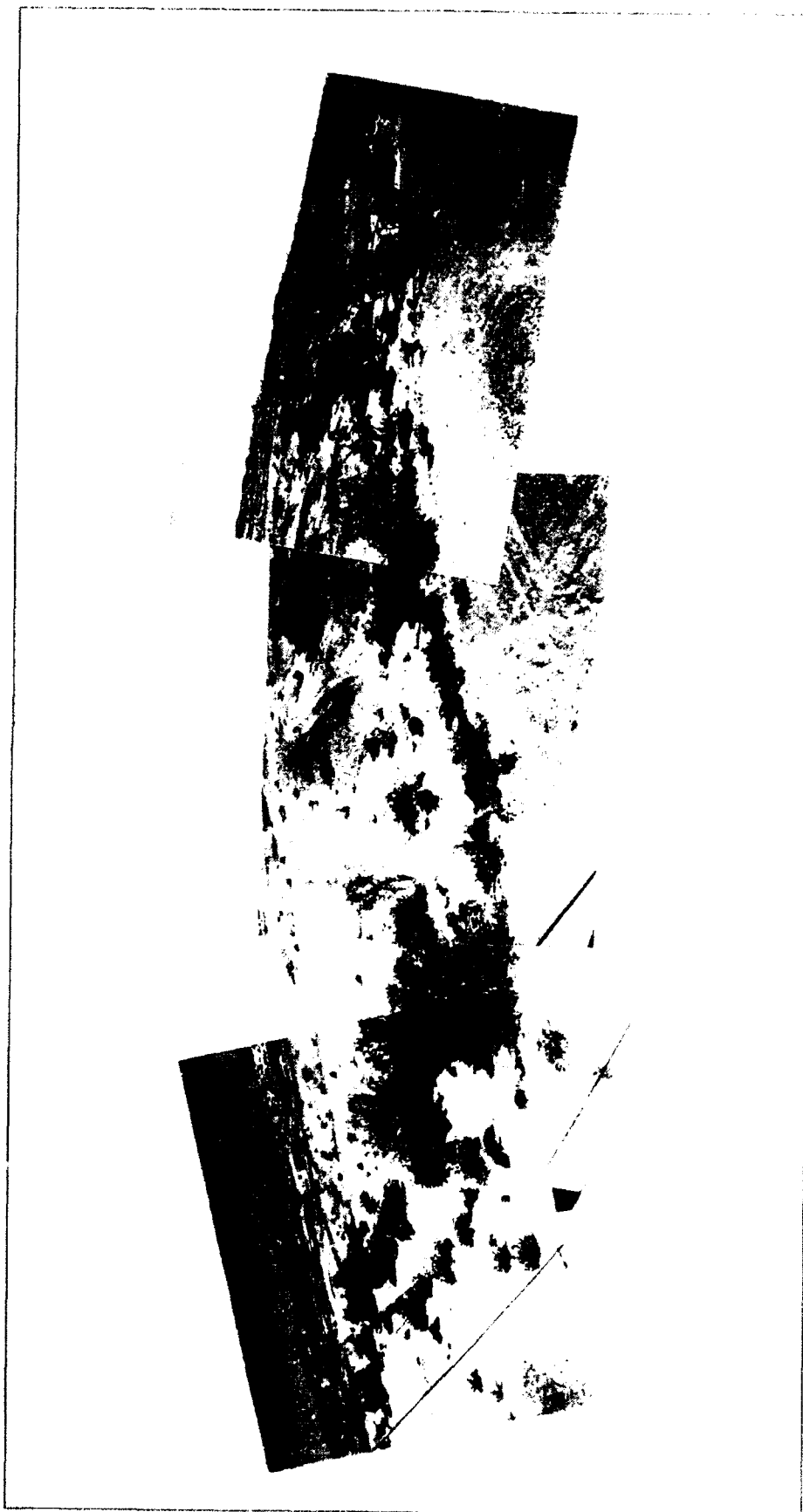


Figure 2. Photograph mosaic of the Control Site

A mobile measurement platform was discounted for two reasons. One was that such platforms are typically not stable enough to allow for the operation of the millimeter wave systems. Generally, one does not want more than a quarter of a wavelength of motion of a sensor during data collection. This allows only about 2 to 3 mm of motion during data collection, an unreasonable expectation for a mobile platform. Another reason for not using a mobile platform is that repeatability of data collection viewing angles and ranges to terrain patches is virtually impossible. One of the purposes of making these measurements is to examine the effects of varying environmental conditions on terrain electromagnetic signatures, and one must have confidence that sensor view angles are virtually unchanged over a range of measurement times.

An air-conditioned trailer was rented and placed adjacent to the observation tower to provide a facility for the array of computers and other system control hardware required for operation of the sensors on the tower and for the limited onsite analysis of those data as well as the meteorological data also collected near the Control Site. The trailer was unusable for its intended purposes for the first several days of onsite operations because of the unavailability of YPG personnel to complete the electrical power hookup.

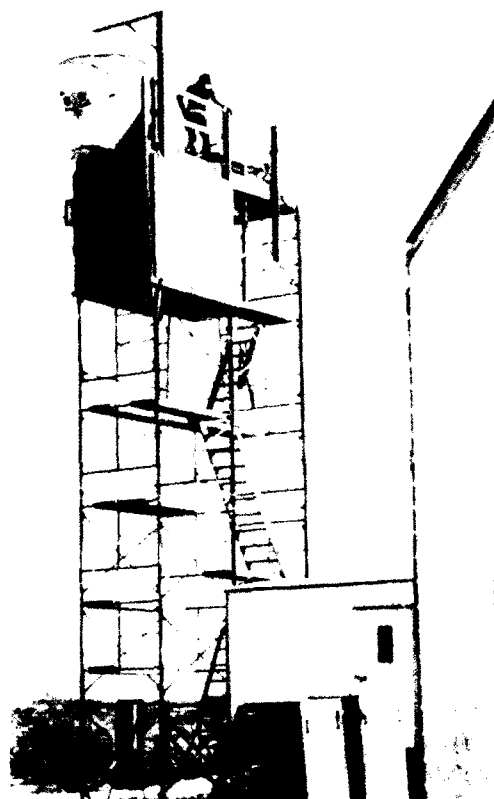


Figure 3. Observation tower and instrumentation trailer

## Overview of Measurements

As stated earlier, the objective of this measurement exercise was to characterize the electromagnetic signatures of terrain in and near the SADARM test area that would form the background to targets being searched for by the contractor sensing systems during the Captive Flight Test. This involves not only image data or pseudo-image data that might be immediately useful to ARDEC and its contractors for establishing background signature statistics, but also data that can be used as input to first-principle terrain signature prediction models and data that simply provide a qualitative basis for what were the test site conditions.

Control Site measurements made during the SADARM Captive Flight Tests can be grouped into the following classes:

- a. Boundary layer radiation exchange data.
- b. Ground surface characteristics.

- c.* Vegetation characteristics.
- d.* Thermal infrared measurements.
- e.* Active millimeter wave measurements.

Subsequent parts of this report will address each of the parameter measurements, describing in some detail the types of measurements, the frequency of data collection, the types of instruments used, and, in some cases, examples of preliminary data analyses.

### 3 Boundary Layer Radiation Exchange Data

---

#### Meteorological Information

During the early stages of setting up for measurements at the Control Site, personnel began collecting data that would provide input to atmospheric boundary layer radiation exchange models as well as onsite weather reports. A 6-m meteorological tower (Figure 4) was set up near the observation tower and outfitted with instruments that recorded the following parameters:

- a.* Air temperature and dew point at 0.5-, 2.0-, and 6.0-m elevations above the ground.
- b.* Horizontal wind speed and wind direction at 0.5, 2.0, and 6.0 m.
- c.* Barometric pressure at 1.0 m.
- d.* Downwelling and upwelling radiation in the wavelength band of 0.3 to 50  $\mu\text{m}$  at an elevation of 1.0 m.

A rain gauge was also set out near the met tower, but no precipitation occurred at the Control Site during the duration of these measurements. Data were collected from the met tower in 1-min intervals.

Appendix A contains a complete listing of all of the meteorological measurements made at the Control Site, with each number representing an average of 1-min measurements made during the preceding 15-min period. Figure 5 is a plot of downwelling radiation over a period of several days combined with air temperature data at 0.5-m elevation that clearly shows that air temperature is not solely a function of solar loading. Over the 11-day period of data collection, peak daily solar loadings were comparable, while both mean and peak air temperature decreased with time.

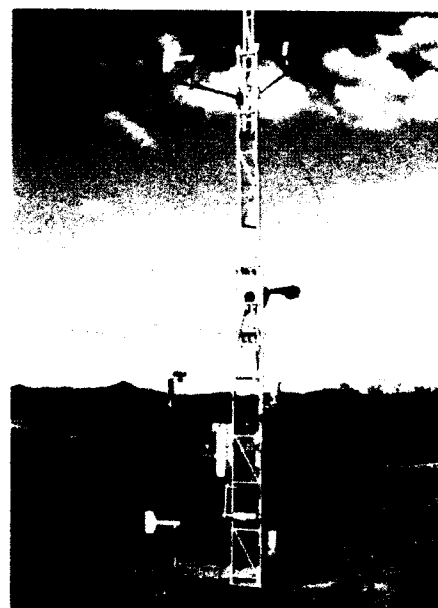


Figure 4. Control Site meteorological tower



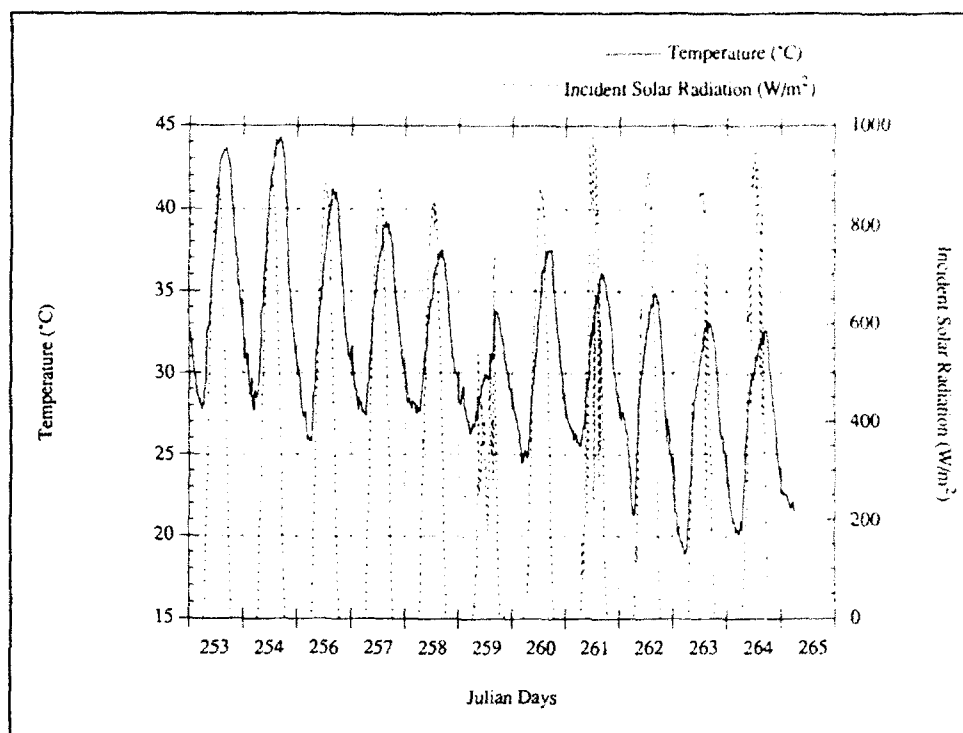


Figure 5. Diurnal variation of solar loading and air temperature

## Soil Temperature Profiles

Two sets of near-soil-surface temperature profile data were collected within the Control Site. These data consisted of average physical temperatures measured by thermistors placed at known depths in soil pits and backfilled. Temperatures measured at 60-sec intervals were averaged over 15-min periods and recorded on magnetic tape using Campbell Scientific CR21 microloggers.

Two soil pits were dug for this purpose. One was located on the north side of the wash within the Control Site, and the other was located on the north bank of the wash (Figure 6). The soil outside of the wash was typically gravelly sand, while that on the bank consisted of a layer of about 40 cm of sandy silt overlaying gravelly sand. Thermistors were inserted into the soil in one corner of each pit at the approximate depths below the surface of 0.0, 2.5, 5.0, 10.0, 20.0, 40.0, and 70.0 cm. The thermistor wires leading to the microloggers were buried in a shallow trench from the profile location to where the microloggers were hidden from view of the sensors on the observation tower.

Appendix B contains a listing of the soil temperature profile data collected from each pit. Figure 7 is a plot of representative soil temperature data recorded in the wash bank pit. Note that the temperature at a 70-cm depth is stable and that gradients between the surface and 70 cm can be nearly +20 °C during the heat of the day and as much as -10 °C at night.



Figure 6. Soil pit being dug on the Control Site wash bank

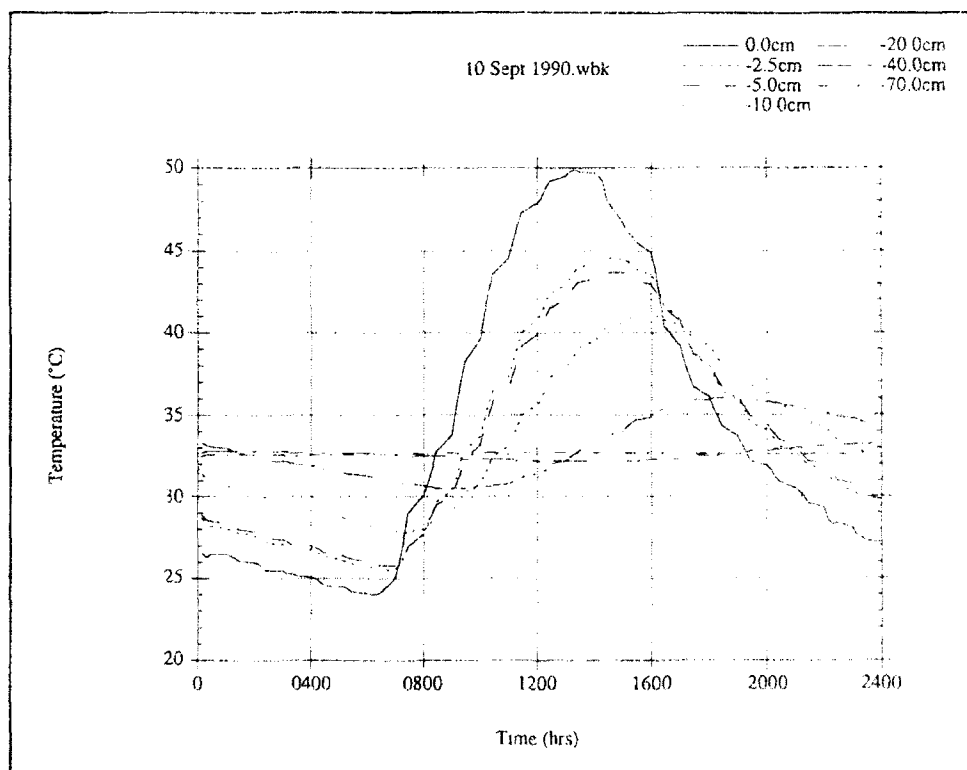


Figure 7. Representative wash bank soil temperature profiles

## 4 Ground Surface Physical Properties and Characteristics

---

### General Description

Both the thermal infrared and active radar signatures of background terrain are dependent upon the material at the surface, the roughness of the surface at the appropriate sensor wavelength, and the geometry of the surface with respect to the sensor; i.e., surface slopes. General comments are in order prior to presentation of specific data.

Surface soil within both the SADARM test area and the Control Site can visually be classified into three broad categories. First of all there is the soil not affected by water flowing through the desert washes. It is typically a gravelly sand in which the gravel at the surface has been exposed by wind and water to form desert pavement (Figure 8), a layer of closely spaced small stones (most less than 2 cm) also subjected to chemical weathering to form the brownish surface called desert varnish. As one moves closer to the wash, this desert pavement appears disturbed possibly by water action, the movement of animals, or by man. There is still a covering of surface stones, but without the desert varnish (Figure 9). It is the disturbed pavement that dominates the soil cover within the Control Site and near the washes within the SADARM test area.

The bottom of well-developed washes such as that within the Control Site typically contain a gravelly sand (Figure 10). Surface particle sizes are generally much smaller than those of the desert pavement. Hydrologic factors account for the deposition of this gravelly sand within the wash.

The banks of the wash are a complex mix of soil types. As indicated in an earlier section, a thick silt deposit exists high on the banks. Again, hydrologic factors could account for these deposits, with the lighter silt particles being dispersed throughout the flowing water rather than simply tumbling along the bottom of the wash as would be true for the gravel. It

is also possible, as shown in Figure 6, that the underlying material can also be exposed by water action, leaving a very rocky type of soil material.

## **Soil Classification**

Appendix C contains the results of laboratory classification of various soil samples taken from the Control Site and reported in the nomenclature of the Unified Soil Classification System. Results labeled "Flat" refer to the samples taken from the soil pit dug in the gravelly sand outside of the wash, whereas those labeled "Wash Bank" refer to the pit dug in the bank of the wash.

## **Moisture Content**

Moisture content in the test area soils can have a dramatic effect upon either the thermal infrared or millimeter wave signatures of the terrain background. Focusing again on the three types of surface soils, numerous soil moisture samples were collected during the conduct of this test site characterization effort. These samples were weighed onsite, sealed, and later dried and weighed again to determine gravimetric moisture contents. Figures 11-13 illustrate that the gravelly sands in both the wash bottom and outside of the washes were quite dry, as expected, with moisture contents varying between 0.75 and 2.5 percent.

Moisture content measurements on the sandy clayey silt on the wash banks were much more variable because of a combination of its texture and the prior weather at the test site. Several days prior to the arrival of the measurement team, the Yuma area had experienced heavy rains. As shown in Figure 6 by the darker patches of soil on the banks of the wash, some of the silt remained fairly wet for several days after the rain, probably because of the clay content of the soil. Data computed from samples taken in what apparently was damp soil are labeled as "wet" on Figure 13 and show a range of values from 13 to 17 percent. The "dry" wash bank silt moisture samples had values ranging from 1 to 4 percent, tending to be slightly higher in moisture content than the gravelly sands from the wash bottoms and surrounding areas.

## **Control Site Topography**

Knowing what the ground elevations are like within the field of view may be very important, as well as the soil texture and moisture content, when interpreting the performance of a sensor that is scanning the terrain. Surface slope data are important in modeling the reflectance of all electromagnetic



Figure 8. Typical desert pavement

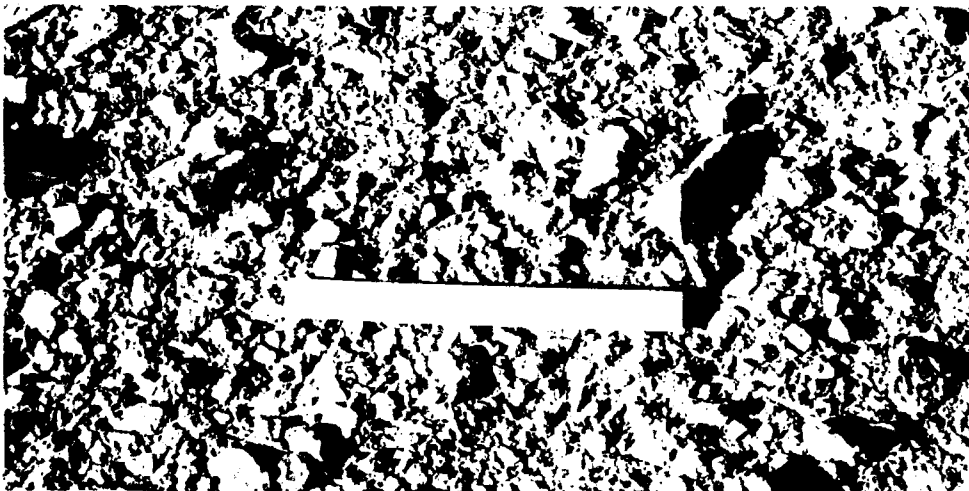


Figure 9. Disturbed desert pavement



Figure 10. Typical wash bottom material

energy, whether the energy source falls in the visible, thermal infrared, or millimeter wave portion of the spectrum. For this reason, a detailed topographic survey of the Control Site was conducted and the data included in the SADARM site characterization data package. Figure 14 is an example of these data plotted at a contour interval of 50 cm using the SURFER software package.

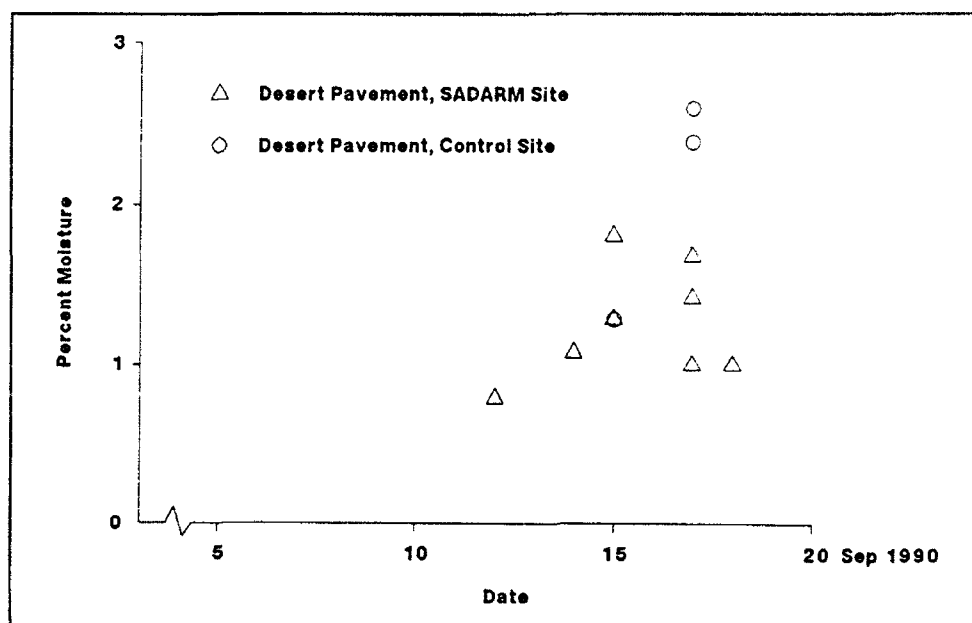


Figure 11. Gravimetric moisture contents for desert pavement

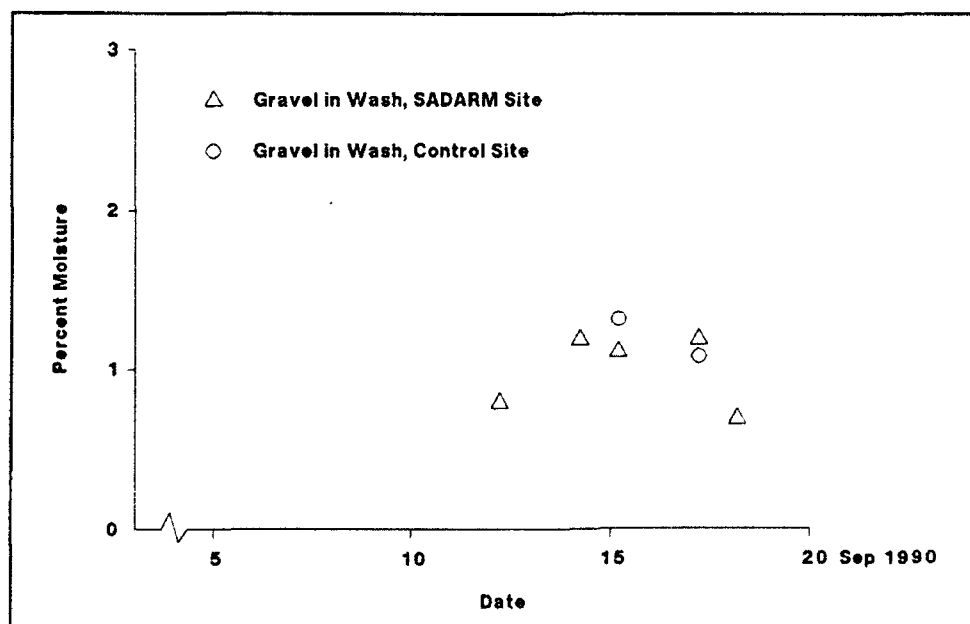


Figure 12. Gravimetric moisture contents for wash bottom gravelly sands

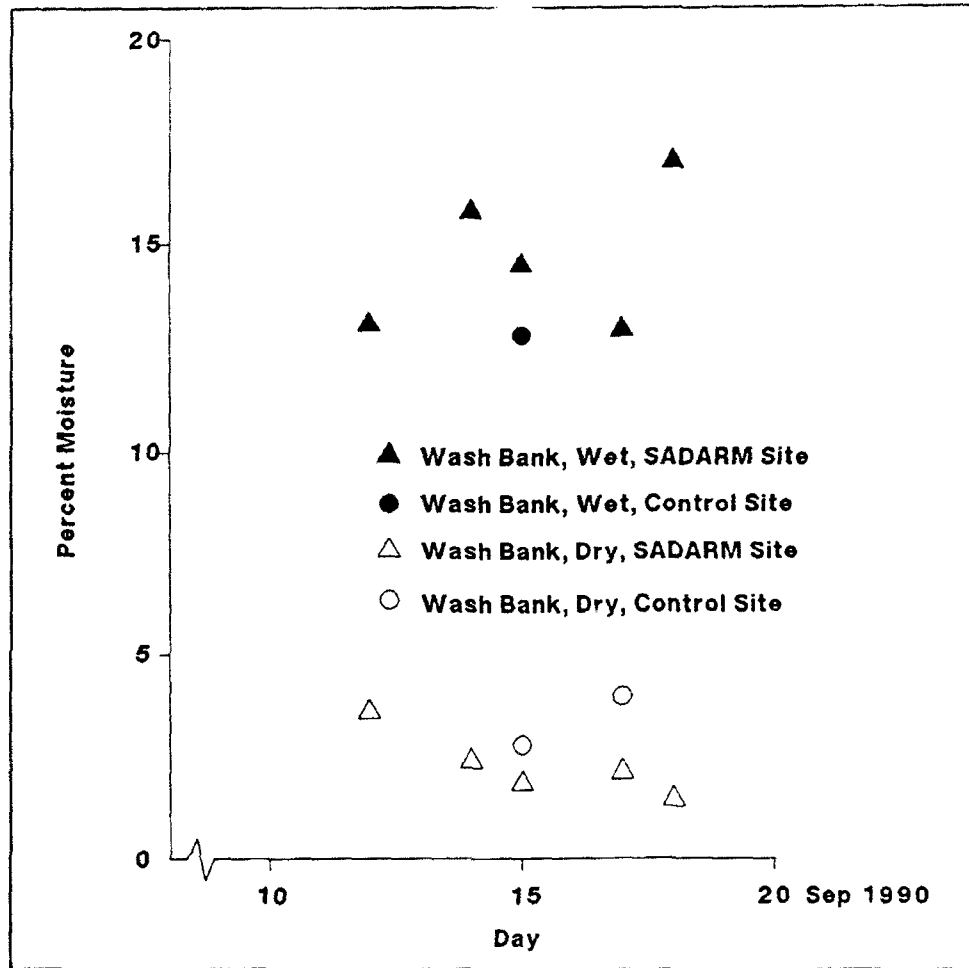


Figure 13. Gravimetric moisture contents for wash bank silt

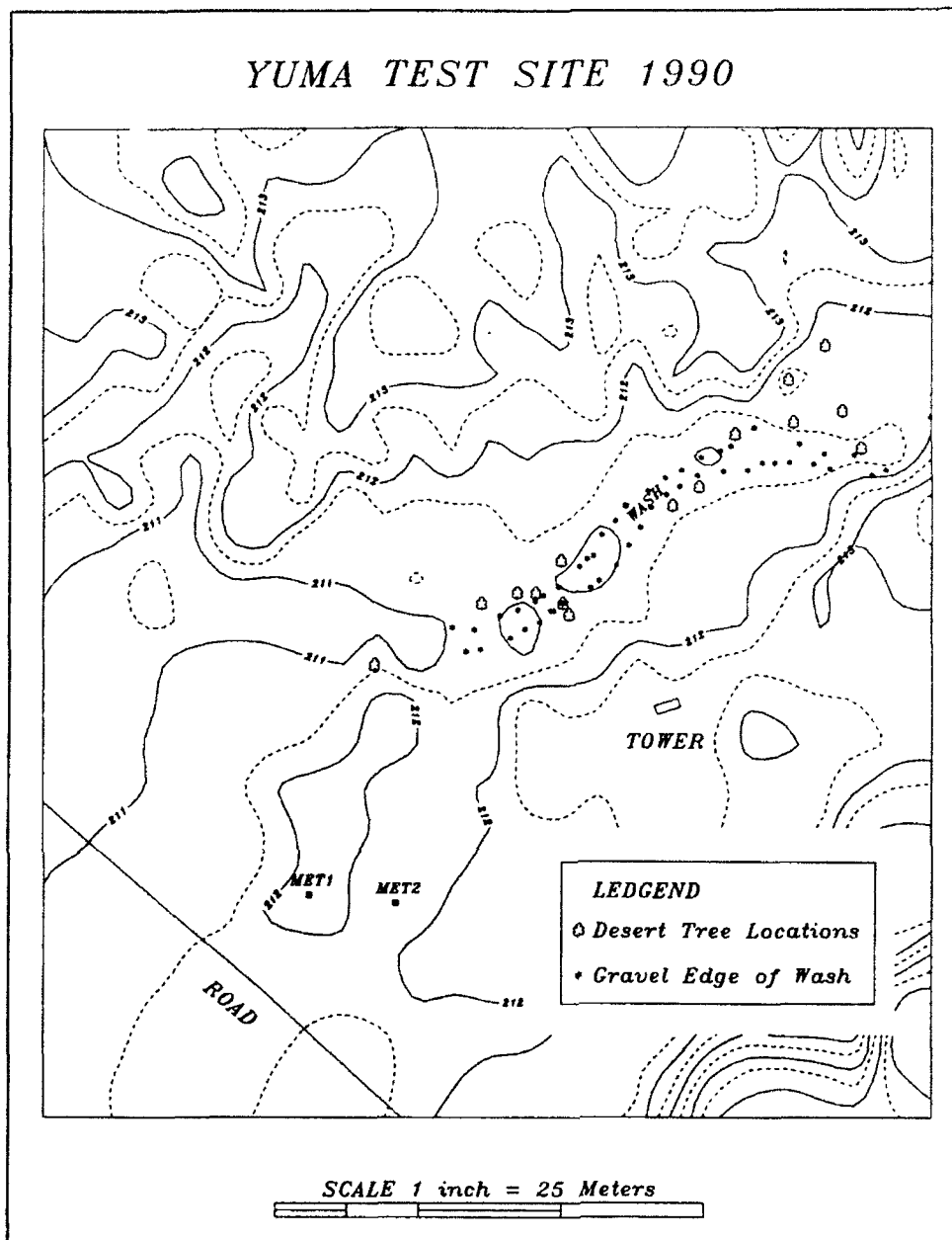


Figure 14. Control Site topography (50-cm intervals)



## 5 Vegetation Characteristics

### General Description

Experience has shown that vegetation presents a definite thermal infrared contrast with background soil, especially during midday conditions of high solar loading. From an active millimeter wave sensor perspective, a large plant or tree serves as both a scattering center because of its wood structure and as an absorber because of its moisture content. In fact, living vegetation has often been modeled as a "cloud" of water, to a first approximation, because of the moisture contained within the twigs and leaves.

Most of the terrain at and near the SADARM test site and the Control Site has minimal vegetation cover. However, a significant amount of vegetation in the form of bushes and small trees exists along the banks of the desert washes, especially the well-developed washes. The following paragraphs describe the dominant species within this test area, provide quantitative data on surface area coverage, and discuss methods to estimate the volumetric moisture content of some of the species.

**Table 1**  
**SADARM Test Area and Control Site**  
**Vegetation Species**

Scientific Name	Common Name	Abbreviation
<i>Ambrosia dumosa</i>	white bur sage	AMDU
<i>Cercidium floridum</i>	blue palo verde	CEFL
<i>Cercidium microphyllum</i>	yellow palo verde	CEMI
<i>Encelia farinosa</i>	brittlebush	ENFA
<i>Krameria paravifolia</i>	white ratany	KRPA
<i>Larrea tridentata</i>	creosote bush	LATR
<i>Lycium</i> sp.	wolfberry	LY—
<i>Olyneya tesota</i>	desert ironwood	OLTE
<i>Opuntia</i> sp.	pencil cholla	OP—

Note: sp. = the species could not be identified in the field.

### Species Identification

Table 1 contains a list of the dominant species of vegetation that are found primarily in and around the developed washes at the SADARM test site and within the Control Site. Photographs of each of these species can be found in Appendix C.

### Areal Densities

As indicated previously, desert pavement was nearly devoid of vegetation;

most plants and bushes were found within the well-developed wash areas. Vegetation also existed in what were called "secondary washes" such as that shown in Figure 15, which are often not more than topographical depressions that collect water during rainfall. Quantitative data on the percent of ground cover offered by the various vegetation species were collected by selecting several vegetation sample sites within the SADARM test area and one site within the Control Site to facilitate the identification of different plant types and the calculation of ground cover or areal density from average plant diameter measurements. Table 2 identifies the physical area included within each vegetation sample site, and Table 3 is a summary table for all areal density measurements. Note the extreme differences in percent cover between the desert pavement sample site and the three different developed wash sites.

The selection of the Control Site was considered representative of the developed wash within the SADARM test area, since the total percent cover and individual species were approximately the same as in the test area.

**Table 2**  
**Vegetation Sample Site Areas**

Sample Site Name	Sample Site Location	Site Area m <sup>2</sup>
Desert Pavement	SADARM Test Site	3 684.1
Secondary Wash		408.5
Developed Wash, Site 1		1 175.4
Developed Wash, Site 2		835.5
Developed Wash	Control Site	410.7



Figure 15 Secondary wash sample site at the SADARM test area

**Table 3**  
**Vegetation Areal Density Summary (Percent Cover)**

Species	Sample Site				
	Desert Pavement	Secondary Wash	Developed Wash, Site 1	Developed Wash, Site 2	Developed Wash, Control Site
AMDU	—	—	—	—	0.75
CEFL	—	—	—	14.92	—
CEMI	0.01	—	<0.01	4.30	—
ENFA	0.22	0.40	5.73	4.25	5.65
KRGR	0.08	—	—	—	1.92
LATR	2.04	16.62	23.30	21.13	16.19
LY—	—	—	9.07	10.43	0.95
OLTE	—	3.39	18.04	15.60	28.46
UNK1	—	—	0.35	0.29	0.10
UNK2	—	—	1.16	1.22	—
UNK3	—	—	0.31	0.43	—
UNK4	—	—	0.91	0.48	—
UNK5	—	—	—	0.04	—
Totals	2.34	5.17	58.87	73.09	54.03

Note: — = species not found at this location; UNKn - unknown species.

## Moisture Content

Plant moisture content has a significant impact upon how much energy from the active millimeter wave sensor gets absorbed and/or scattered by the plant. Therefore, a limited number of plant-moisture measurements were conducted in the following way. A sample of leaves (if any), twigs, and branches for a selected plant was collected from a known volume within the plant. This sample was weighed onsite and later oven-dried and reweighed. From these measurements the average volumetric moisture content of several of the plant species was calculated and are shown in Table 4. Recent weather was expected to have a significant impact upon the number of samples taken for each species.

**Table 4**  
**Summary of Average Plant Moisture Contents**

Species	N	Plant Water	Plant, Dry	Water, percent
CEFL	5	865.48	774.82	53
CEMI	5	630.14	632.42	50
ENFA	7	851.00	1,057.55	45
LATR	5	449.50	824.94	35
LY—	4	646.63	1,875.35	26
OLTE	5	195.28	382.22	34

Note: N = number of samples taken.

## 6 Thermal Infrared Measurements

---

In addition to characterizing the SADARM test site in terms of soil types, vegetation types, topography, and moisture contents, the measurement team also collected calibrated thermal infrared and active millimeter wave sensor data. This chapter of the report describes what kinds of thermal infrared data were collected.

### Image Data

#### Measurement Setup

A pair of Inframetrics 500 thermal infrared imaging systems were attached to the frame of the observation tower at the Control Site on a remotely controlled pan-and-tilt unit placed about 9 m above the ground. One camera operated in the 3- to 5- $\mu\text{m}$  wavelength band, while the other operated in the 8- to 12- $\mu\text{m}$  band. Separate control units for each camera were operated within the air-conditioned tower enclosure immediately behind the cameras. Analog video images from each controller were recorded on separate VHS recorders. Both manual and audio logs were maintained for all scene recordings.

Calibration data for each set of imagery were collected by pointing the cameras at three different blackbodies located on the ground a few meters north of the observation tower. Figure 16 is a photograph of the ambient temperature blackbody. Figure 17 shows the two black plates used to



Figure 16. Ambient air temperature blackbody

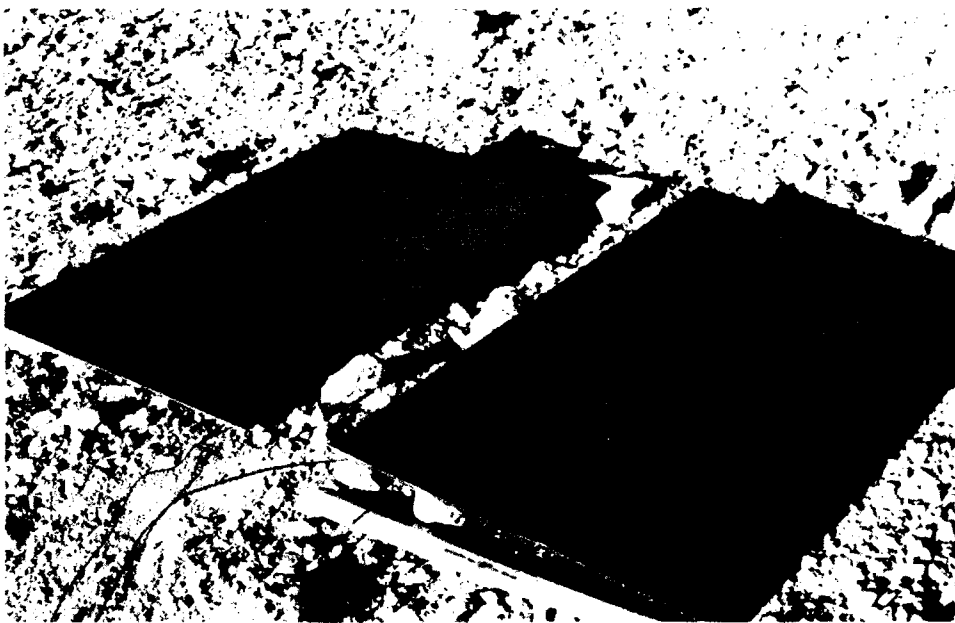


Figure 17. Two passive blackbody metal calibration plates

provide nonambient reference temperature values. All three devices were instrumented with thermocouples connected to a micrologger so that calibration device physical temperatures could be recorded at regular intervals.

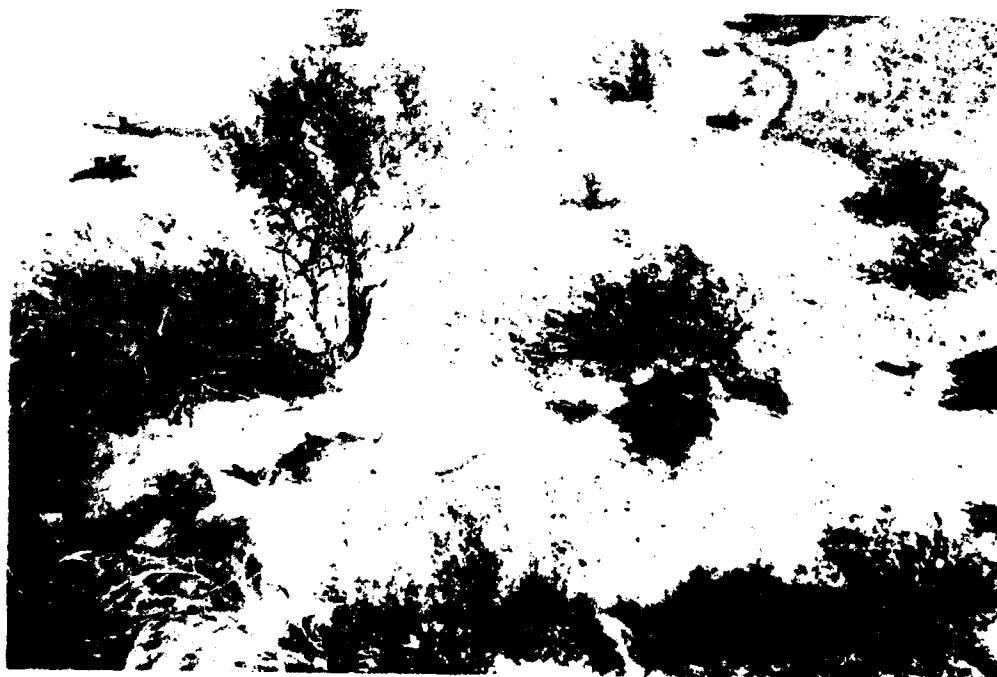
### **Summary of data collected**

A list of all of the times and conditions under which thermal infrared imagery of the Control Site were collected is shown on Table 5. Each time data were collected, the measurement sequence included a scan of the blackbodies followed by a 10-sec scan at each of 11 predetermined views of the wash and its surroundings. Features of the scene were selected for image measurement based on experience and a preliminary scan of the terrain shortly after the observation tower was assembled and the imaging systems made operational. Photographs that approximate the fields of view of the thermal imaging systems for each of these predetermined views are included in Appendix D. As an example of the types of thermal imagery collected during this measurement period, Figure 18 contains images of one view of the Control Site wash taken at midnight, noon, and early evening that clearly show how environmental conditions can affect the background conditions. Given that white is hot in these thermal snapshots, one sees that the vegetation is hotter than the background at night, cooler than the surrounding soils at noon, and radiates thermal infrared energy at about the same rate as the soils during "crossover" periods that take place in the early evening (and early morning).

**Table 5**  
**Summary of Thermal Infrared Imagery**

Date	Time, hr	3 to 5 $\mu\text{m}$	8 to 12 $\mu\text{m}$	Remarks
13 Sep 90	0730-0749	x		8- to 12- $\mu\text{m}$ infrared system experiencing phasing problems
	0830-0844	x		
	1106-1119	x		
	1231-1242	x		
	1407-1413	x		
	1459-1508	x		
14 Sep 90	0759-0804	x		
	0902-0909	x		
	1013-1020	x		
	1102-1108	x		
	1154-1200	x		
	1259-1305	x		
15 Sep 90	0032-0036	x	x	Start of diurnal test  Very high winds
	0100-0105	x	x	
	0151-0154	x	x	
	0212-0217	x	x	
	0309-0315	x	x	
	0400-0405	x	x	
	0500-0506	x	x	
	0600-0606	x	x	
	0700-0705	x	x	
	0838-0843	x	x	
	0900-0905	x	x	
	0915-0919	x	x	
	1200-1205	x	x	
	1412-1417	x	x	
	1500-1505	x	x	
	1603-1608	x	x	
	1730-1737	x	x	
	1800-1805	x	x	
	1811-1815	x	x	
	1900-1905	x	x	
	2018-2022	x	x	
	2124-2129	x	x	
	2200-2204	x	x	
	2300-2305	x	x	
	2345-2350	x	x	
17 Sep 90	0800-0816	x	x	
	0830-0834	x	x	
	0900-0904	x	x	
	1010-1014	x	x	
	1100-1112	x	x	
	1208-1211	x	x	
	1320-1324	x	x	
	1403-1407	x	x	
	1453-1457	x	x	
	1501-1504	x	x	
18 Sep 90	1250-1253	x	x	Site of 1st experiment
	1300-1311	x	x	
	1315-1316	x	x	
	1330-1331	x	x	
	1344-1346	x	x	
	1404-1405	x	x	
	1415-1416	x	x	
	1447-1448	x	x	
	1501-1501	x	x	
	1502-1502	x	x	
	1528-1528	x	x	
(Continued)				

Table 5 (Concluded)				
Date	Time, hr	3 to 5 $\mu\text{m}$	8 to 12 $\mu\text{m}$	Remarks
19 Sep 90	0748-0748	x	x	Control scene only        Site of 2nd experiment Site of 2nd experiment Water added
	0957-0958	x	x	
	1001-1001	x	x	
	1003-1006	x	x	
	1008-1011	x	x	
	1142-1143	x	x	
	1323-1324	x	x	
	1503-1504	x	x	
	1521-1521	x	x	
	1523-1523	x	x	
	1558-1558	x	x	
20 Sep 90	0813-0819	x	x	
	0917-0922	x	x	
	1022-1027	x	x	
	1308-1314	x	x	



a. Visual

Figure 18. Control Site, scene 4 imagery (Continued)

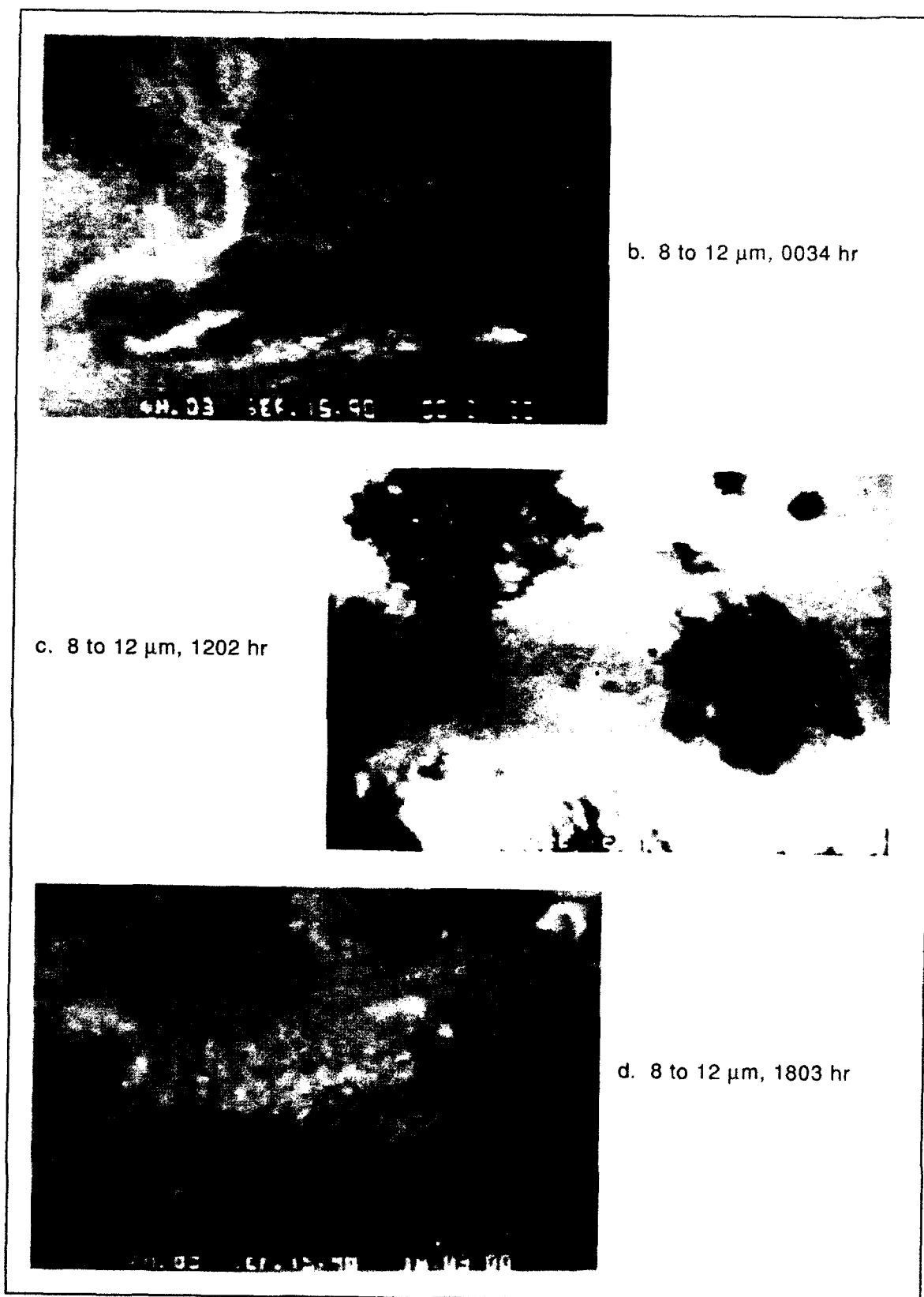


Figure 18. (Concluded)



## Additional Measurements

### Measurement setup

In an effort to quantify the temporal behavior of the thermal infrared signature of terrain within the Control Site (and, hence, the SADARM test area), a small portion of the wash that was out of view of the millimeter wave systems was selected for further measurements. At this location (Figure 19), eight staring radiometers, operating in the 8- to 14- $\mu\text{m}$  band of wavelengths, were positioned on support poles to acquire data on selected terrain features listed in Table 6. Photographs that indicate what was being viewed by each radiometer are contained in Appendix E.

<b>Table 6</b> <b>Terrain Features Examined by the Staring Radiometers</b>	
<b>Radiometer Number</b>	<b>Terrain Feature</b>
1	Undisturbed desert pavement
2	Vegetation (AMDU), south side
3	Wash gravel
4	Shaded bank soil
5	Wash bank, north-facing
6	Vegetation (ENFA), south side
7	Vegetation (??), west side, later pointed toward silty soil
8	Deadwood, south side

### Summary of data collected

One-minute average temperatures for each of these radiometers were stored on a Campbell Scientific 21X micrologger. Appendix D contains the tabulated results of those measurements. Because of problems with the holding mechanism, results for Radiometer 7 are not considered valid until 1715 hr on Day 263, at which time the radiometer was pointed downward toward the silt on the wash bank and the holder firmly tightened. As an example of the kind of data available from these measurements, Figure 20 shows the temporal variation in wash gravel apparent temperatures over a period of several days.



Figure 19. Photograph of the spot temperature measurement site

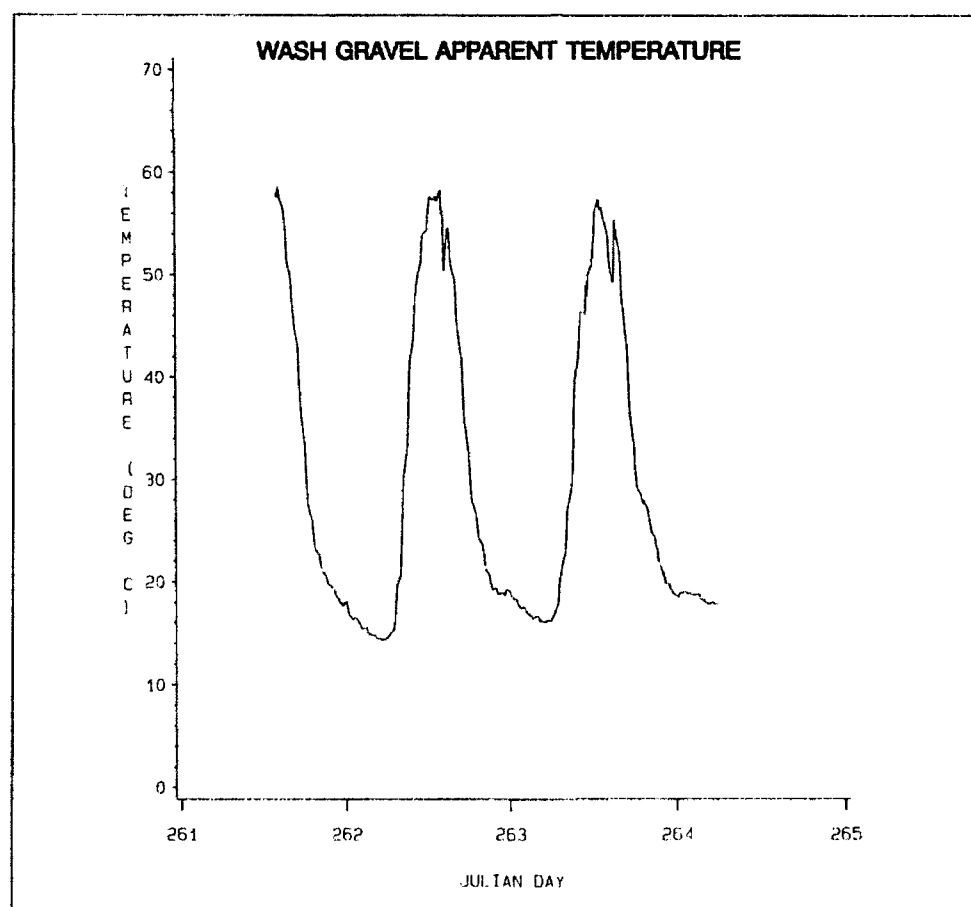


Figure 20. Temporal variation in radiometric temperature for wash gravel

## Simulated Rainfall Experiments

Because of the total absence of rainfall during the Captive Flight Tests, two simulated rainfall experiments were conducted near the end of the measurement period. The purpose of these experiments was to demonstrate the dramatic change in terrain thermal infrared signatures caused by high soil moisture levels and to obtain quantitative data on how quickly the terrain surface can dry out following a significant rainfall event.

The first experiment was conducted on the gravelly, clayey, silty, sand near the base of the observation tower. The view through the thermal infrared cameras was at a depression angle of about 40 deg. An area on the ground of about 5 m<sup>2</sup> was wetted with enough tap water to approximate a rainfall of about 1 cm. Soil moisture samples were collected periodically, the results of which are shown in Table 7. Thermal infrared images of the wet soil and its immediate surroundings were collected during the times listed in Table 5. A preliminary review of the image data indicates that the initial thermal contrast between the wet soil and its surroundings was approximately 6 °C. The soil surface took about 2 days to dry out.

A second experiment was conducted on the sandy, clayey, silt on the south bank of the wash in front of the observation tower. The resulting depression angle for the thermal imaging cameras was about 25 deg. As before, soil moisture samples were collected and image data collected. Initial thermal contrast was approximately 6 to 7 °C, and, as with the gravelly sand, the silt took about 2 days to return to the dry state.

**Table 7**  
**Soil Moisture Measurements Supporting the Simulated Rainfall**  
**Experiments**

Soil	Date	Time hr	Moisture Content percent	Note
Gravelly sand	9/18/90	1230	0.7	Background
	9/18/90	1240	12.8	Immediately after wetting
	9/18/90	1310	12.5	Wet soil
	9/18/90	1345	10.7	Wet soil
	9/18/90	1415	9.9	Wet soil
	9/18/90	1445	8.6	Wet soil
	9/18/90	1545	7.4	Wet soil
	9/19/90	0845	1.2	Background
	9/19/90	0849	4.3	Wet soil
	9/20/90	0750	2.4	Wet soil
	9/20/90	0810	2.1	Background
Sandy silt	9/19/90	1550	1.8	Background
	9/19/90	1600	34.2	Immediately after wetting
	9/19/90	1630	24.2	Wet soil
	9/19/90	1700	23.6	Wet soil
	9/19/90	1730	22.2	Wet soil
	9/20/90	0758	14.8	Wet soil
	9/20/90	1730	2.7	Wet soil

## 7 Active Millimeter Wave Radar Measurements

---

### Measurement Procedure

Another part of the ground truth electromagnetic signature data set was that collected by the active  $K_a$ -band scatterometer<sup>1</sup> located at the top of the Control Site observation tower. The scatterometer (shown in Figures 21 and 22) was operated remotely from the trailer parked at the base of the tower. Because of the adverse temperature and dust conditions that existed at the Control Site, care was taken to protect the scatterometer components by enclosing the pan-and-tilt unit in a reflective blanket that allowed freedom of movement and by covering the transmitter and receiver boxes with reflective materials wherever possible. Air-conditioning was provided by blowing air from the thermal infrared control room on the tower up into the protective blanket. Holes in the base of the transmitter and receiver boxes allowed some of that air to be passed through to their delicate components.

The scatterometer is controlled by a Hewlett Packard 8510B Network Analyzer System. As configured for the YPG measurements, a signal covering the bandwidth of 2.0 to 2.5 GHz in 400 increments was sent to the transmitter front end via semirigid coaxial cable where it was upconverted to a sweep of 33.0 to 33.5 GHz. This results in a theoretical range resolution of 30 cm. The 400 frequency increments mean that the alias-free range is 240 m, which was more than enough to cover the terrain being measured. This scatterometer was configured to transmit horizontal and vertical polarizations and to receive both polarizations. It is capable of transmitting and receiving circular polarizations, but this feature has not been tested.

External calibration measurements were facilitated by placing two different aluminum corner reflectors on camera tripods at a range of about

---

<sup>1</sup> Zoll, M. (1990). "Design and construction of a  $K_a$ -band scatterometer," Draft Report, U.S. Army Ballistic Research Laboratory, Aberdeen Proving Ground, MD.

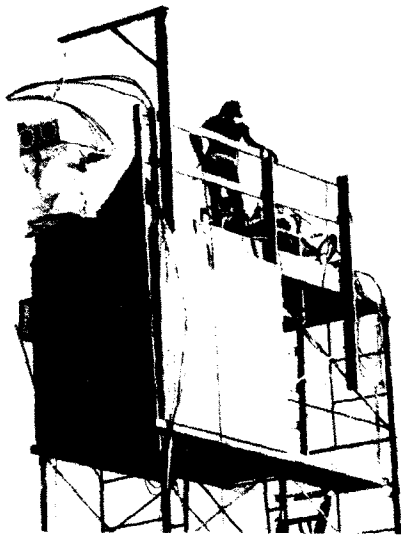


Figure 21. The  $K_a$ -band scatterometer on top of the observation tower



Figure 22. Close-up view of the scatterometer

22 m from the antennas. One reflector was a trihedral having a theoretical radar cross section of 9.39 dBsm, while the other was a dihedral with a theoretical cross section of 8.344 dBsm. The tripods were not covered. The trihedral was tilted up toward the antennas and its position adjusted to give the strongest received signal in the like-polarization channels. The dihedral was manually positioned at an angle of 45 deg to give the strongest signal in the cross-polarization channels.

The spatial pattern of measurements conducted with the scatterometer can best be visualized by referring to Figure 2. The trihedral and dihedral corner reflectors were placed on tripods positioned to the left of the observation tower. The trihedral can be seen at the lower left-hand corner of Figure 2. Beginning with the transmitter polarization set to vertical, the trihedral was illuminated, followed by the dihedral. A scan of the desert pavement (out of view to the left in Figure 2) was then conducted in 2-deg depression angle increments, beginning with 30 deg and ending at 70 deg. Two-degree increments were chosen to provide overlapping data; the antennas have circular radiation patterns with 4.1-deg beamwidths. The antennas were then pointed at a terrain feature in the wash at the far right-hand side of Figure 2, and a scan pattern was begun to the left that covered an azimuth sweep of 80 deg in 2-deg increments and 11 scans from a starting depression angle of 10 deg to a final angle of 30 deg. This scan pattern covered all of the significant vegetation and wash bank features visible in Figure 2. Following completion of the wash scan, three additional azimuth

sweeps (at depression angles of 40, 50, and 60 deg) of the bare desert soil in front of the observation tower were conducted. The antennas were then pointed again at the trihedral, the transmitter polarization as changed to horizontal, and the process repeated. Finally, the antennas were pointed at the sky and measurements made to help quantify the noise floor. This scan pattern is sketched in Figure 23.

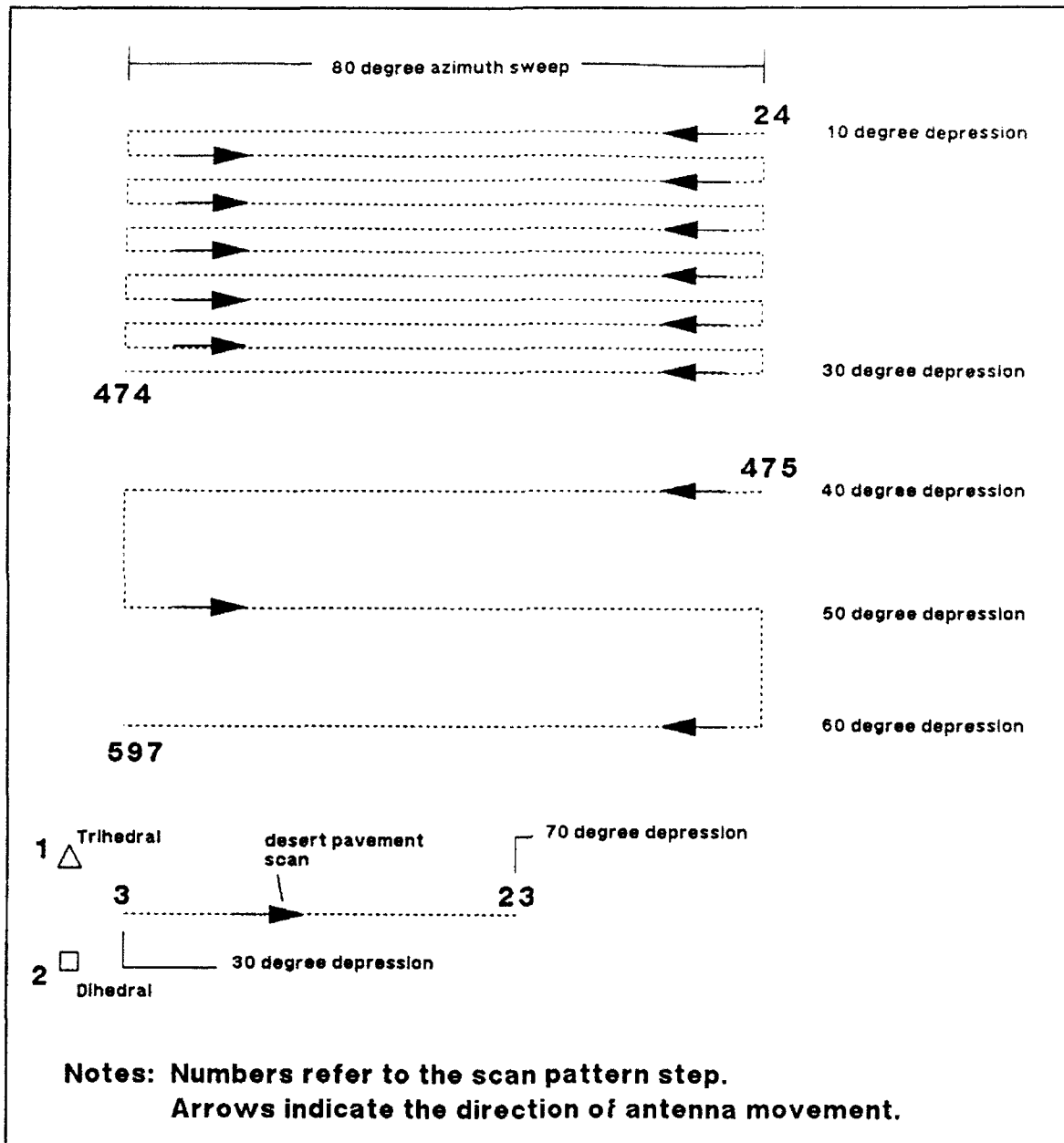


Figure 23. Scatterometer scan pattern

The entire measurement procedure was relatively slow as compared with the response time of tactical radar systems. The primary reason for this is because the network analyzer used to control the scatterometer is a

scientific data collection device designed for accuracy and stability, but not the speed of operation demanded by tactical systems. Each complete measurement sequence took about 1 hr and 50 min.

Measurements of the wetted soils were also made so that later analyses might reveal the effects of water on millimeter wave backscatter from moist soils as compared with dry soils. Table 8 contains a listing of the scatterometer data that was collected at YPG.

**Table 8**  
**Summary of Scatterometer Data Collected at YPG**

Date	Start Time, hr	Description
9/13/90	0304	Full Control Site scan
9/14/90	0529	Full Control Site scan
9/14/90	1818	Full Control Site scan
9/14/90	2306	Full Control Site scan
9/15/90	0420	Full Control Site scan (vertical transmit only)
9/15/90	0534	Full Control Site scan
9/15/90	1137	Full Control Site scan
9/15/90	1836	Full Control Site scan
9/17/90	1244	Full Control Site scan
9/18/90	1244	Wet gravel measurements
9/18/90	1314	Wet gravel measurements
9/18/90	1345	Wet gravel measurements
9/18/90	1417	Wet gravel measurements
9/18/90	1445	Wet gravel measurements
9/18/90	1545	Wet gravel measurements
9/19/90	1540	Wet silt measurements
9/19/90	1600	Wet silt measurements
9/19/90	1632	Wet silt measurements
9/19/90	1702	Wet silt measurements
9/19/90	1731	Wet silt measurements
9/20/90	0741	Wet silt measurements
9/20/90	1000	Wet silt measurements
9/20/90	1136	Wet silt measurements
9/20/90	1517	Wet silt measurements
9/20/90	1718	Wet silt measurements
9/20/90	1537	Wet gravel measurements (2nd time)
9/20/90	1555	Wet gravel measurements (2nd time)
9/20/90	1605	Wet gravel measurements (2nd time)
9/20/90	1634	Wet gravel measurements (2nd time)
9/20/90	1723	Wet gravel measurements (2nd time)



## Preliminary Data Analysis

### Radar cross-section measurements

Some preliminary analyses have been conducted and are described in the next few paragraphs. These studies were performed on the same Hewlett Packard 9000 Series 300 computer that was used to control the network analyzer during the field measurements.

The first analysis is one designed to produce a radar cross-section (RCS) map of the Control Site study area. Such a map gives an indication of where the strongest scattering centers are located within the field of view. The maximum RCS value for each range resolution cell at a given azimuth position was determined by systematically tabulating returns for every measurement made during the measurement sequence. The simplified radar range equation was used to perform these calculations under the assumption that all quantities are constant within the range resolution cell being considered. Normalized radar cross-section calculations of the vegetation cover and rough terrain within the Control Site wash are impossible because illuminated area cannot be determined. A flat earth assumption is meaningless for this site.

A representative RCS map for a vertical transmit, vertical receive scatterometer configuration is shown in Figure 24. Without much imagination, one can see the 40-, 50-, and 60-deg desert soil scans at the base of the fan. Other strong returns appear to be associated with some of the vegetation and sharp terrain features that could cause enhanced backscatter. While it is possible to refer to the photomosaic in Figure 2 as an aid in interpreting the returns shown on the RCS map, a one-to-one correspondence with terrain features is still not possible until the RCS data are combined with a three-dimensional topographic map to ascertain what is being illuminated by the scatterometer at each range and azimuth. The strip to the left of the main fan in Figure 24 is the desert pavement scan that is conducted first in each measurement sequence.

### Normalized radar cross sections of desert pavement

A separate analysis was performed on the desert pavement data; i.e., those data collected at the beginning of each scan that cover depression angles ranging from 30 to 70 deg. Because the terrain at this location is almost flat, it is possible to make some assumptions about illuminated area and compute a normalized radar cross section, or backscatter coefficient, often referred to in the literature as  $\sigma$ . Again, the simplified radar range equation was utilized with the assumption that all quantities were constants within the half-power (or 3 dB) beamwidth. That beamwidth was used to calculate an illuminated area. Table 9 contains a list of these calculations for each depression angle of the scatterometer. Range is the slant range, in meters, to the peak return from the terrain surface. RCS is in units of

dBsm (dB above a square meter), area is in square meters, and the backscatter coefficient is in dB. An average coefficient was computed from the nonlogarithmic values.

**Table 9**  
**Representative Backscatter Coefficient Calculations**

Angle	Range	RCS	Area	$\sigma$
30.0	24.2	-7.8	0.600	-5.6
32.0	21.8	-9.8	0.551	-7.2
34.0	21.2	-6.2	0.549	-3.6
36.0	20.4	-6.7	0.542	-4.0
38.0	20.4	-11.2	0.557	-8.7
40.0	18.4	-12.3	0.515	-9.4
42.0	18.2	-11.8	0.525	-9.1
44.0	17.3	-9.3	0.515	-6.4
46.0	17.1	-9.4	0.527	-6.6
48.0	16.9	-15.2	0.541	-12.6
50.0	15.8	-11.1	0.526	-8.3
52.0	15.9	-13.9	0.556	-11.3
54.0	15.4	-14.2	0.562	-11.7
56.0	14.8	-11.4	0.569	-9.0
58.0	14.6	-8.3	0.592	-6.1
60.0	14.2	-9.2	0.612	-7.1
62.0	13.7	-11.7	0.626	-9.7
64.0	13.7	-8.7	0.670	-7.0
66.0	13.1	-14.0	0.693	-12.4
68.0	13.1	-14.6	0.752	-13.3
70.0	12.9	-10.6	0.812	-9.7
Average Backscatter Coefficient = -7.71 dB.				

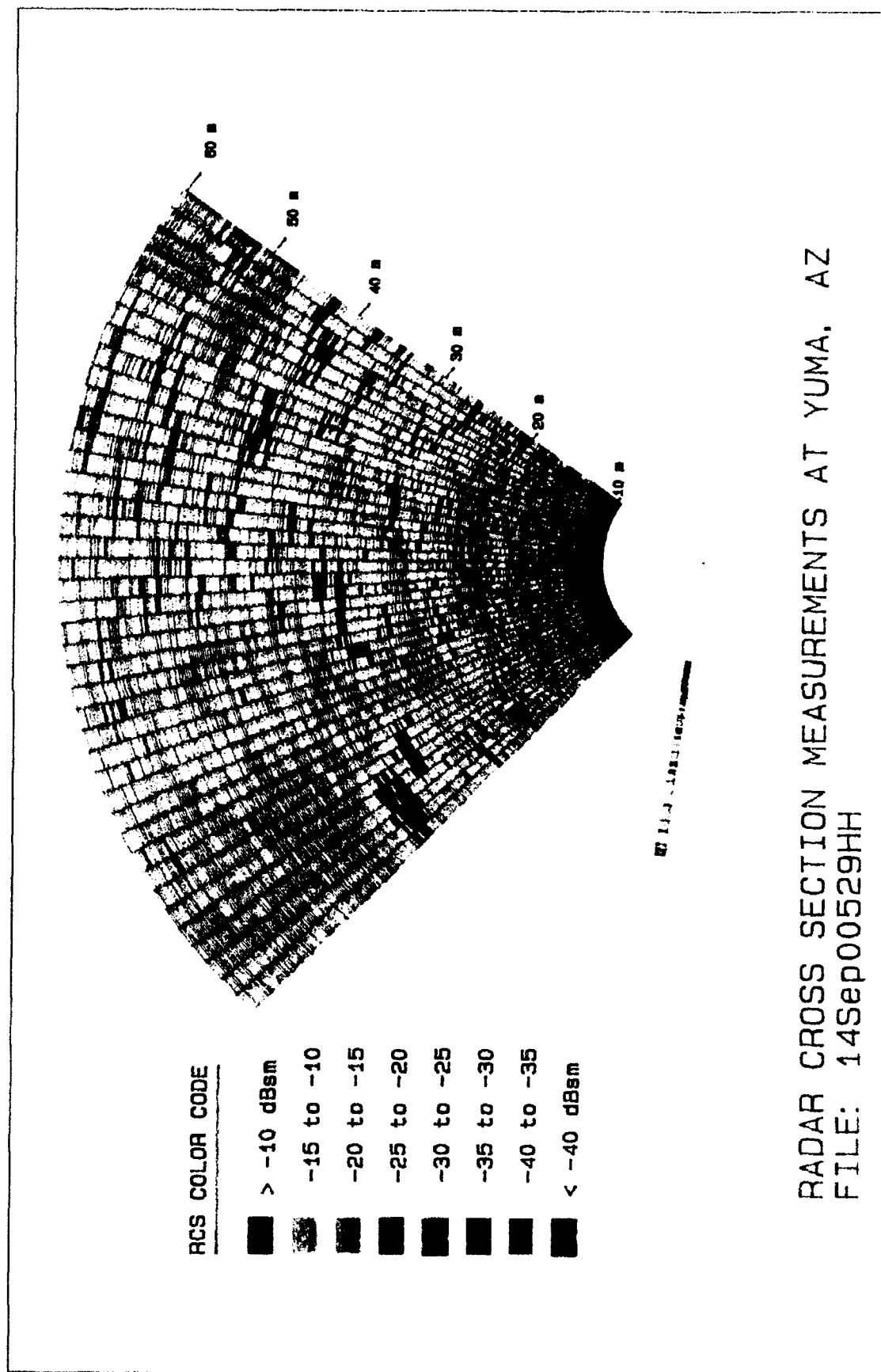


Figure 24. Representative RCS map of the Control Site

# Appendix A

## Meteorological Data

---

The following pages list weather parameter data and other data useful for evaluating the atmospheric boundary layer energy exchange phenomenon at the Control Site near the Serve and Destroy Armor test area, Yuma Proving Ground, AZ. These data were collected during a 2-week period in September 1990. Tabulated data represent 15-min averages. Parameter definitions are as follows:

TIME hhmm	local standard time in 24-hr format
PRESS mbs	pressure in millibars
TEMP c	temperature in degrees Centigrade
RH %	relative humidity in percent
WD/SP mph	wind speed in miles per hour
WD/DIR dir	wind direction in degrees relative to true north
PRCP mm	precipitation in millimeters (water equivalent)
VSBY km	visibility in kilometers
PSP vert	radiation flux in watts/m <sup>2</sup> , 0.3- to 3- $\mu$ m sensitivity pyranometer facing up
PSP invert	radiation flux in watts/m <sup>2</sup> , 0.3- to 3- $\mu$ m sensitivity pyranometer facing down
PIR vert	radiation flux in watts/m <sup>2</sup> , 3- to 50- $\mu$ m sensitivity pyrgeometer facing up
PIR invert	radiation flux in watts/m <sup>2</sup> , 3- to 50- $\mu$ m sensitivity pyrgeometer facing down

Tabulated data are followed by diurnal plots of several of the parameters. Solar radiation plots are taken from the pyranometer data, while long-wave radiation plots represent pyrgeometer measurements.

In addition to the data listed in this report, other information is available from the data files stored at the Cold Regions Research and Engineering Laboratory, including daily weather observations taken by the U.S. Army

Atmospheric Sciences Laboratory (ASL), Yuma meteorological team, daily synoptic RAWINSONDE (balloon-borne instrument for measuring air temperature, humidity, pressure, and wind speed) upper air soundings also provided by the ASL met team, and a climatological summary for the Yuma Proving Grounds for the month of September.

<b>Meteorological Instrumentation Specifications</b>				
<b>Parameter</b>	<b>Instrument</b>	<b>Sensor Type</b>	<b>Range</b>	<b>Accuracy</b>
Station Pressure Pressure	Sierra - Misco Model 1520	Aneroid Sensor Multi Cell	650 to 1,050 mbs	±0.2 mbs
Wind Speed and Wind Direction	R. M. Young	Speed - Tachometer Director - Potentiometer	0-50 m/sec 0-355	±2% ±2%
Temperature and Relative Humidity	Rotronic MP-100	PT 100 $\Omega$ RTD Capacitive Hygrometer	-50 to 150 °C 0 to 100%	±0.35 °C ±2%
Precipitation	Belfort Instruments Rain Gage	Tipping bucket	0" to 100"	±0.5%
Solar Radiometer	Eppley Precision Pyranometer	Thermopile	0.3 to 3 $\mu\text{m}$	±1%
Solar Radiometer	Eppley Precision Pyrgometer	Thermopile	3 to 50 $\mu\text{m}$	±3%



92/03/12  
14:55:50

METEOROLOGICAL DATA  
SADAM ENVIRONMENTAL AREA  
11 SEP 1990

11sep 15.min



TIME	PRESS	TEMP	RH	WIND	DIR	PRCT	VSBY	RADIATION				WATTS/M <sup>2</sup>
								PSP	PPF	PPR	PIR	
hhmm	mba	c	%	mph	dir	mm	km	vert	invert	vert	invert	
0015	986.0	32.2	27	1.5	33	0.0	MSC	0	0	0	391	484
0030	986.0	32.1	27	0.7	111	0.0	MSC	0	0	0	389	483
0045	986.0	31.9	28	3.2	35	0.0	MSC	0	0	0	389	482
0100	986.0	30.9	32	3.3	29	0.0	MSC	0	0	0	385	480
0115	986.0	30.9	31	3.4	31	0.0	MSC	0	0	0	385	479
0130	986.0	30.8	29	3.4	29	0.0	MSC	0	0	0	386	479
0145	986.0	30.5	30	1.4	12	0.0	MSC	0	0	0	383	476
0200	986.0	31.2	27	1.1	4	0.0	MSC	0	0	0	385	477
0215	986.0	31.1	28	3.2	43	0.0	MSC	0	0	0	385	476
0230	986.0	30.2	32	2.8	47	0.0	MSC	0	0	0	382	474
0245	986.0	29.1	34	0.3	7	0.0	MSC	0	0	0	377	469
0300	986.0	29.1	34	1.2	153	0.0	MSC	0	0	0	377	467
0315	986.0	28.7	33	0.8	356	0.0	MSC	0	0	0	378	467
0330	986.0	29.2	32	0.6	30	0.0	MSC	0	0	0	378	466
0345	986.0	29.7	30	2.6	3	0.0	MSC	0	0	0	382	468
0400	986.0	29.5	31	0.3	349	0.0	MSC	0	0	0	377	464
0415	986.0	28.6	35	1.3	19	0.0	MSC	0	0	0	374	462
0430	986.0	27.9	37	1.1	16	0.0	MSC	0	0	0	373	460
0445	986.0	27.8	37	0.4	15	0.0	MSC	0	0	0	373	460
0500	986.0	27.7	38	0.9	38	0.0	MSC	0	0	0	372	458
0515	986.0	28.4	40	2.2	138	0.0	MSC	0	0	0	374	459
0530	986.0	28.6	42	0.9	102	0.0	MSC	0	0	0	374	459
0545	986.0	28.8	46	1.2	115	0.0	MSC	0	0	0	374	460
0600	986.0	28.3	49	0.7	132	0.0	MSC	0	0	0	373	458
0615	986.0	28.7	50	0.3	37	0.0	MSC	5	2	372	458	
0630	986.0	28.5	51	0.7	306	0.0	MSC	17	11	376	462	
0645	986.0	28.8	50	2.7	300	0.0	MSC	11	70	385	470	
0700	986.0	29.5	46	3.4	259	0.0	MSC	14	70	385	470	
0715	986.0	30.2	44	3.5	246	0.0	MSC	124	90	386	487	
0730	986.0	30.4	44	3.2	241	0.0	MSC	173	129	386	487	
0745	986.0	31.0	42	2.2	311	0.0	MSC	225	170	387	496	
0800	986.0	31.9	42	3.9	308	0.0	MSC	284	217	390	509	
0815	986.0	31.7	35	0.3	75	0.0	MSC	139	213	392	518	
0830	986.0	31.8	34	3.1	152	0.0	MSC	339	310	394	529	
0845	986.0	34.3	30	3.2	327	0.0	MSC	453	335	394	539	
0900	986.0	34.8	27	3.7	310	0.0	MSC	501	388	395	548	
0915	986.0	35.3	24	4.4	222	0.0	MSC	544	419	400	562	
0930	986.0	35.4	24	4.4	222	0.0	MSC	597	484	404	582	
0945	986.0	36.3	22	4.5	229	0.0	MSC	632	484	404	582	
1000	986.0	36.9	20	3.5	239	0.0	MSC	656	499	410	595	
1015	986.0	37.8	17	4.2	247	0.0	MSC	689	524	418	601	
1030	986.0	38.5	16	2.9	255	0.0	MSC	721	547	418	617	
1045	986.0	39.3	14	4.0	247	0.0	MSC	772	592	419	625	
1100	986.0	40.5	13	5.7	223	0.0	MSC	809	627	426	644	
1115	986.0	40.0	12	4.2	217	0.0	MSC	844	649	424	646	
1130	986.0	40.5	13	5.7	223	0.0	MSC	866	667	426	646	
1145	986.0	40.7	15	6.0	211	0.0	MSC	858	661	426	643	
1215	986.0	41.2	12	4.3	224	0.0	MSC	890	690	430	643	
1230	986.0	41.6	11	3.0	232	0.0	MSC	890	689	436	646	
1245	986.0	42.0	12	4.3	252	0.0	MSC	893	693	430	666	
1300	986.0	42.5	12	4.2	217	0.0	MSC	887	686	440	680	
1315	986.0	42.5	13	4.8	193	0.0	MSC	877	678	437	673	
1330	986.0	42.4	13	5.3	216	0.0	MSC	844	670	432	671	
1345	986.0	42.7	14	6.5	210	0.0	MSC	852	659	433	669	
1400	986.0	43.5	12	6.0	199	0.0	MSC	836	645	432	667	
1415	986.0	43.2	12	7.4	207	0.0	MSC	810	623	423	657	

1430	986.2	43.6	8	7.4	199	0.0	MSC	775	593	428	661
1445	986.2	43.7	8	10.8	193	0.0	MSC	735	564	422	652
1500	986.2	44.2	8	11.4	182	0.0	MSC	709	539	423	647
1515	986.2	44.0	8	9.1	186	0.0	MSC	667	504	420	643
1530	986.2	44.0	6	2.6	204	0.0	MSC	617	463	415	645
1545	986.2	43.9	6	6.8	206	0.0	MSC	573	428	407	632
1600	986.2	44.0	6	5.5	190	0.0	MSC	524	389	406	630
1615	986.2	44.2	5	7.2	192	0.0	MSC	474	350	400	615
1630	986.2	44.3	5	6.0	194	0.0	MSC	427	313	400	611
1645	986.2	44.3	4	8.6	195	0.0	MSC	379	279	393	597
1700	986.2	44.2	4	8.3	203	0.0	MSC	328	242	391	588
1715	986.2	44.0	4	7.4	201	0.0	MSC	272	200	391	580
1730	986.2	44.0	5	8.8	194	0.0	MSC	220	160	392	573
1745	986.2	43.7	5	6.2	197	0.0	MSC	166	120	389	566
1800	986.2	43.5	5	8.0	191	0.0	MSC	115	82	388	556
1815	986.2	43.1	6	7.8	190	0.0	MSC	64	44	386	547
1830	986.2	42.5	7	7.6	197	0.0	MSC	24	16	382	528
1845	986.2	41.7	7	5.0	202	0.0	MSC	0	0	381	528
1900	986.2	40.3	9	4.5	203	0.0	MSC	0	0	382	523
1915	986.2	39.9	23	10.3	201	0.0	MSC	0	0	386	522
1930	986.2	38.9	23	10.8	197	0.0	MSC	0	0	385	525
1945	986.2	37.5	41	6.0	203	0.0	MSC	0	0	408	521
2000	986.2	36.7	41	6.5	199	0.0	MSC	0	0	407	521
2015	986.2	36.4	41	6.5	199	0.0	MSC	0	0	406	519
2030	986.2	36.0	42	10.9	195	0.0	MSC	0	0	401	516
2045	986.2	35.4	44	7.4	200	0.0	MSC	0	0	399	513
2100	986.2	34.9	45	5.1	217	0.0	MSC	0	0	399	513
2115	986.2	34.4	46	5.1	217	0.0	MSC	0	0	397	512
2130	986.2	34.2	45	6.4	218	0.0	MSC	0	0	391	507
2145	986.2	33.1	48	6.4	218	0.0	MSC	0	0	391	504
2160	986.2	32.1	48	8.3	225	0.0	MSC	0	0	385	501
2175	986.2	32.1	50	7.2	221	0.0	MSC	0	0	385	499
2190	986.2	32.2	51	2.6	230	0.0	MSC	0	0	384	494
2205	986.2	32.0	53	2.4	216	0.0	MSC	0	0	389	494
2220	986.2	31.7	53	4.4	216	0.0	MSC	0	0	386	492
2235	986.2	31.3	51	5.1	238	0.0	MSC	0	0	382	489
2250	986.2	31.1	54	5.1	240	0.0	MSC	0	0	378	487
2305	986.2	30.8	55	3.9	269	0.0	MSC	0	0	378	487
2320	986.2	30.6	56	3.2	310	0.0	MSC	0	0	380	485
2335	986.2	30.6	56	3.2	310	0.0	MSC	0	0	380	484

0.0

REMARKS: MSG - MISSING

362552







374716

1

920312  
145645

15sep 15min

METEOROLOGICAL DATA  
RADIAN ENVIRONMENTAL AREA  
13 SEP 1990

TIME	TEMP	RH	WD/DIR	PRCP	VSFT	PSP	VSFT	WATTS/M <sup>2</sup>	PIR	PIR
hhmm	mba	%	mph	dir	mm	vert	invert	vert	invert	vert
0015	986.9	28.5	55	1.5	311	0.0	36.8	0	0	391
0100	986.9	28.3	56	0.0	314	0.0	36.7	0	0	391
0245	986.9	28.2	55	1.4	323	0.0	39.4	0	0	387
0100	986.9	28.2	54	1.0	347	0.0	40.0	0	0	401
0115	986.9	28.1	55	2.5	207	0.0	37.1	0	0	395
0130	986.9	28.4	55	3.0	313	0.0	51.2	0	0	410
0145	986.9	28.9	51	6.7	2	0.0	37.1	0	0	423
0200	986.9	29.0	53	14.9	69	0.0	40.0	0	0	421
0215	986.9	29.2	50	13.8	87	0.0	48.6	0	0	410
0230	986.9	29.5	50	13.3	69	0.0	46.3	0	0	394
0245	986.9	27.8	51	10.9	66	0.0	44.3	0	0	403
0300	986.9	27.9	47	10.9	72	0.0	69.9	0	0	393
0315	986.9	27.7	48	9.8	73	0.0	72.6	0	0	392
0330	986.9	27.4	50	11.7	73	0.0	46.3	0	0	389
0345	986.9	27.2	50	11.5	79	0.0	34.5	0	0	383
0400	986.9	27.1	53	7.7	80	0.0	33.7	0	0	382
0415	986.9	27.1	54	9.7	92	0.0	33.6	0	0	386
0430	986.9	26.8	55	6.7	96	0.0	34.9	0	0	392
0445	986.9	26.8	56	5.5	83	0.0	33.1	0	0	384
0500	986.9	26.4	57	3.0	112	0.0	33.6	0	0	392
0515	986.9	26.3	55	4.5	143	0.0	33.9	0	0	412
0530	986.9	26.6	54	3.8	155	0.0	33.4	0	0	416
0545	986.9	26.5	55	2.9	175	0.0	36.5	0	0	410
0600	986.9	26.6	55	4.4	85	0.0	40.6	0	0	427
0615	986.9	26.9	53	5.3	65	0.0	33.4	0	0	427
0630	986.9	26.9	53	6.6	73	0.0	34.9	0	0	439
0645	986.9	26.8	54	6.5	79	0.0	33.2	0	0	435
0700	986.9	26.9	55	5.4	73	0.0	34.3	0	0	435
0715	986.9	27.2	54	4.1	69	0.0	36.3	0	0	419
0730	986.9	27.3	53	4.3	79	0.0	32.4	0	0	425
0745	986.9	27.5	53	8.1	91	0.0	32.9	0	0	423
0800	986.9	27.1	55	10.4	99	0.0	32.8	0	0	442
0815	986.9	27.2	55	7.6	102	0.0	35.2	0	0	416
0830	986.9	28.3	52	7.6	105	0.0	34.7	0	0	402
0845	986.9	28.3	52	12.7	105	0.0	33.8	0	0	404
0900	986.9	28.4	52	10.2	97	0.0	36.3	0	0	412
0915	986.9	28.1	52	10.2	97	0.0	36.3	0	0	416
0930	986.9	28.2	53	9.6	99	0.0	36.5	0	0	418
0945	986.9	28.6	52	6.9	105	0.0	34.5	0	0	428
1000	986.9	28.8	51	8.6	99	0.0	34.0	0	0	430
1015	986.9	29.3	49	9.2	102	0.0	34.3	0	0	440
1030	986.9	29.2	49	9.7	104	0.0	35.8	0	0	438
1045	986.9	29.6	48	11.2	103	0.0	35.0	0	0	432
1100	986.9	29.6	48	8.8	108	0.0	35.1	0	0	431
1115	986.9	29.6	49	7.5	108	0.0	37.1	0	0	411
1130	986.9	29.9	49	7.5	101	0.0	41.2	0	0	405
1145	986.9	29.9	51	10.9	92	0.0	38.7	0	0	423
1200	986.9	29.7	51	7.8	108	0.0	36.0	0	0	435
1215	986.9	29.9	50	6.3	105	0.0	39.1	0	0	428
1230	986.9	29.8	51	5.8	94	0.0	38.4	0	0	429
1245	986.9	29.8	52	5.6	92	0.0	38.2	0	0	434
1300	986.9	29.8	53	7.3	103	0.0	38.4	0	0	444
1315	986.9	29.8	53	8.6	100	0.0	40.2	0	0	439
1330	986.9	29.8	53	8.6	91	0.0	40.2	0	0	441
1345	986.9	30.0	54	5.4	90	0.0	40.5	0	0	435
1400	986.9	30.4	51	6.0	100	0.0	38.3	0	0	431

1415	986.8	31.1	52	7.3	123	0.0	40.3	0	0	435
1430	986.8	30.7	53	6.5	112	0.0	37.9	0	0	441
1445	986.8	31.0	52	6.9	117	0.0	36.9	0	0	440
1500	986.8	31.2	51	1.3	126	0.0	36.6	0	0	439
1515	986.7	31.4	49	6.3	122	0.0	36.6	0	0	440
1530	986.7	31.9	47	5.6	113	0.0	37.0	0	0	435
1545	986.5	32.6	44	4.5	114	0.0	42.5	0	0	462
1600	986.5	33.0	43	4.1	127	0.0	36.7	0	0	473
1615	986.8	33.2	41	4.7	121	0.0	39.1	0	0	453
1630	986.5	33.7	40	3.0	166	0.0	41.5	0	0	400
1645	986.3	33.8	38	7.8	144	0.0	35.2	0	0	436
1700	986.1	33.7	39	5.9	161	0.0	34.7	0	0	430
1715	986.0	33.8	38	6.7	163	0.0	34.8	0	0	432
1730	985.8	33.7	40	5.4	170	0.0	36.7	0	0	420
1745	985.6	33.5	42	3.9	147	0.0	51.2	0	0	411
1800	985.4	33.4	42	4.9	170	0.0	36.8	0	0	427
1815	985.4	33.3	42	6.2	155	0.0	38.3	0	0	416
1830	985.3	32.9	43	6.4	148	0.0	37.0	0	0	412
1845	985.1	32.6	45	4.7	151	0.0	46.8	0	0	417
1900	984.9	32.4	45	5.8	148	0.0	39.2	0	0	417
1915	984.7	32.3	45	5.8	145	0.0	36.9	0	0	402
1930	984.6	32.1	46	5.1	147	0.0	35.9	0	0	412
1945	984.7	31.9	46	3.8	139	0.0	45.1	0	0	406
2000	984.7	31.7	47	4.5	142	0.0	51.5	0	0	421
2015	984.9	31.3	48	3.9	108	0.0	38.6	0	0	412
2030	985.0	31.1	48	6.2	102	0.0	35.7	0	0	422
2045	985.2	30.8	49	6.3	97	0.0	37.4	0	0	425
2100	985.3	30.5	51	5.8	87	0.0	34.5	0	0	414
2115	985.4	30.2	51	6.6	90	0.0	36.1	0	0	423
2130	985.4	30.0	53	5.5	87	0.0	35.6	0	0	400
2145	985.5	29.8	54	4.8	88	0.0	36.7	0	0	399
2200	985.5	29.5	57	5.5	86	0.0	36.6	0	0	394
2215	985.5	29.3	57	8.6	82	0.0	37.2	0	0	397
2230	985.5	29.2	58	6.1	90	0.0	37.2	0	0	397
2245	985.5	29.1	58	7.3	79	0.0	37.5	0	0	405
2300	985.5	29.0	58	5.3	78	0.0	37.8	0	0	394
2315	985.5	28.8	58	5.9	76	0.0	37.9	0	0	393
2330	985.3	28.8	59	5.9	85	0.0	38.1	0	0	396
2345	985.3	28.6	57	6.2	85	0.0	38.1	0	0	396
2400	985.3	28.4	57	6.2	85	0.0	38.1	0	0	396
ANG	986.2	29.4	51	6.7	101	0.0	38.1	0	0	203325
WME	987.7	34.6	59	18.6	38	0.0	0.0	0.0	0.0	203325
NOT	986.6	26.2	38							

92/03/12  
14:57:00

METEOROLOGICAL DATA  
SADAM ENVIRONMENTAL AREA  
16 SEP 1990

16sep 15.min

1

TIME	PRESS	TEMP	RH	WIND	MO/DIR	PREC	VSRY	RADIATION	WATTS/M <sup>2</sup>
h:mm	mb	C	%	mph	dir	mm	km	PSP	PIR
								vert	inert
0015	985.1	28.4	55	6.8	84	0.0	33.8	0	408
0030	985.2	28.3	55	4.5	98	0.0	39.3	0	390
0045	985.1	28.1	55	5.1	104	0.0	33.4	0	395
0100	985.1	27.8	55	5.9	95	0.0	32.4	0	392
0115	984.8	27.6	56	6.3	91	0.0	37.2	0	389
0130	984.7	27.5	57	8.2	91	0.0	33.1	0	393
0145	984.6	27.3	59	5.4	89	0.0	33.4	0	381
0200	984.4	27.2	59	5.3	79	0.0	35.5	0	389
0215	984.3	27.0	60	4.7	84	0.0	34.7	0	373
0230	984.2	26.7	61	5.2	94	0.0	32.3	0	368
0245	984.2	26.5	62	3.6	62	0.0	34.8	0	382
0300	984.1	26.4	62	4.0	78	0.0	36.2	0	375
0315	984.1	26.2	63	3.2	101	0.0	33.2	0	365
0330	984.0	25.7	65	1.3	139	0.0	34.1	0	382
0345	984.0	25.6	66	1.1	132	0.0	34.4	0	371
0400	983.9	25.3	67	0.7	124	0.0	36.6	0	371
0415	983.8	24.5	69	0.3	132	0.0	41.4	0	381
0430	983.8	24.5	69	3.1	123	0.0	35.1	0	381
0445	983.7	24.6	69	2.0	33	0.0	35.4	0	380
0500	983.7	24.7	69	2.0	38	0.0	34.9	0	382
0515	983.7	24.9	68	2.3	47	0.0	35.3	0	374
0530	983.7	25.1	66	3.1	76	0.0	33.4	0	376
0545	983.8	25.3	66	3.1	76	0.0	33.4	0	373
0600	983.8	25.2	67	1.9	91	0.0	36.7	0	370
0615	983.9	25.1	67	1.9	91	0.0	35.5	0	378
0630	984.1	24.9	69	6.5	76	0.0	36.1	0	367
0645	984.2	24.8	70	5.1	82	0.0	37.5	12	31
0700	984.3	24.9	70	5.0	89	0.0	37.9	65	58
0715	984.3	25.2	69	5.5	93	0.0	34.5	82	56
0730	984.7	25.6	68	6.9	92	0.0	34.9	165	104
0745	984.9	26.0	65	6.3	91	0.0	35.3	263	193
0800	985.1	26.6	64	5.8	92	0.0	34.8	195	154
0815	985.2	27.2	61	6.2	99	0.0	34.3	317	243
0830	985.3	27.6	59	5.3	97	0.0	35.5	362	284
0845	985.4	28.1	56	5.0	113	0.0	34.0	434	334
0900	985.4	28.6	54	5.7	116	0.0	39.7	478	352
0915	985.7	29.2	53	5.6	115	0.0	37.9	513	393
0930	985.9	29.3	51	3.3	110	0.0	36.7	588	438
0945	986.0	29.9	48	6.3	128	0.0	33.6	591	441
1000	986.0	30.4	47	4.8	165	0.0	36.3	590	447
1015	986.0	30.6	47	2.9	142	0.0	39.1	631	477
1030	986.1	31.1	45	6.2	134	0.0	34.4	661	516
1045	986.1	31.1	45	4.0	138	0.0	34.7	770	590
1100	986.1	32.0	42	6.5	154	0.0	42.4	787	616
1115	986.0	32.2	43	4.9	149	0.0	36.4	825	627
1130	986.0	32.5	42	5.1	158	0.0	37.8	836	650
1145	985.9	33.1	42	5.0	169	0.0	36.5	845	658
1200	985.9	33.3	41	8.0	193	0.0	35.7	857	672
1215	985.7	33.8	38	7.8	163	0.0	37.5	873	668
1230	985.6	33.9	38	4.9	176	0.0	36.9	868	672
1245	985.4	34.4	36	7.1	140	0.0	39.9	866	667
1300	985.3	34.9	36	6.5	158	0.0	36.5	856	671
1315	985.2	34.8	34	6.5	183	0.0	36.4	864	646
1330	985.1	35.6	31	11.4	163	0.0	33.7	853	644
1345	984.9	36.1	27	6.0	174	0.0	33.8	822	630
1400	984.7	36.4	27	13.3	166	0.0	37.7	813	611

0.0 377684

AVG 984.1 30.8 45 6.4 152  
MAX 986.1 37.8 70 14.9  
MIN 982.1 24.3 15

38.3

38.3

1

## 17sep 15.min

1415	987.2	31.6	33	7.5	154	0.0	52.7	800	427	424	422
1416	987.3	34.5	33	5.5	154	0.0	52.7	555	428	424	404
1417	987.4	34.5	33	5.6	175	0.0	36.3	277	211	410	373
1418	987.5	34.5	38	7.5	148	0.0	49.4	658	527	418	440
1419	987.5	35.4	39	7.1	135	0.0	54.5	322	480	414	611
1420	987.5	35.4	39	3.2	140	0.0	37.7	340	263	410	390
1421	986.4	35.7	29	4.0	117	0.0	34.9	610	457	438	615
1422	986.1	36.0	30	6.1	155	0.0	38.5	505	385	427	588
1423	986.3	36.1	30	2.7	162	0.0	39.1	468	350	431	606
1424	986.2	36.2	30	5.7	153	0.0	39.7	422	270	429	597
1425	986.2	35.8	30	6.8	146	0.0	39.3	359	270	421	568
1426	986.0	36.0	28	7.0	186	0.0	36.0	215	151	422	566
1427	985.9	36.0	29	7.8	186	0.0	42.7	234	175	414	566
1428	985.8	35.8	29	7.5	166	0.0	38.0	106	71	413	540
1429	985.7	35.6	29	4.9	191	0.0	44.1	119	101	413	549
1430	985.8	35.6	29	6.9	187	0.0	44.1	77	57	413	561
1431	985.5	35.3	30	5.9	178	0.0	38.7	19	2	408	328
1432	985.4	34.9	31	5.4	179	0.0	37.9	9	2	406	321
1433	985.3	34.6	32	4.6	194	0.0	36.9	0	0	413	520
1434	985.2	34.5	32	6.5	176	0.0	40.9	0	0	411	511
1435	985.2	34.3	32	3.5	175	0.0	40.4	0	0	420	509
1436	985.2	34.2	32	5.4	173	0.0	40.4	0	0	415	507
1437	985.3	33.9	32	5.3	169	0.0	56.9	0	0	406	497
1438	985.0	33.5	33	4.6	157	0.0	58.9	0	0	414	504
1439	985.4	33.2	33	3.7	143	0.0	40.6	0	0	418	500
1440	985.6	33.0	33	4.9	160	0.0	40.2	0	0	405	504
1441	985.9	32.5	36	5.6	186	0.0	41.7	0	0	420	487
1442	985.9	31.7	40	8.0	202	0.0	42.1	0	0	425	493
1443	986.6	30.3	48	11.7	218	0.0	40.5	0	0	401	494
1444	986.4	30.3	49	11.4	218	0.0	42.4	0	0	394	488
1445	986.7	30.1	49	6.2	210	0.0	42.7	0	0	392	486
1446	986.7	29.9	50	6.8	205	0.0	42.0	0	0	396	482
1447	986.7	29.6	52	3.6	217	0.0	52.0	0	0	392	485
1448	986.7	29.3	52	3.6	217	0.0	42.9	0	0	396	482
1449	986.7	29.3	53	5.5	264	0.0	48.0	0	0	378	479
1450	986.7	28.8	53	4.6	264	0.0	48.0	0	0	382	481
1451	986.7	28.7	53	4.6	350	0.0	48.7	0	0	380	475
1452	986.7	28.4	54	4.1	199	0.0	43.7	0	0	382	478
1453	986.6	28.2	55	4.8	214	0.0	44.5	0	0	383	464
1454	986.6	28.2	53	5.9		0.0	43.5	0	0	385	466
1455	985.6	30.3	54	6.5	174	51.3					
MAX	986.5	36.5	61	14.2							
AVG	983.1	25.4	27			0.0		303811			

**0.0**

**NOT**

1

18sep 15.min

1415	988.6	34.2	11	4.2	226	0.0	33.4	794	607	378	627
1430	988.6	34.1	11	5.5	209	0.0	35.2	750	580	403	625
1445	988.4	34.1	11	3.7	207	0.0	46.7	726	550	370	611
1500	988.4	34.3	10	3.5	212	0.0	38.9	683	512	376	613
1515	988.3	34.3	10	7.0	210	0.0	35.8	642	504	368	613
1530	988.3	34.7	10	4.6	233	0.0	33.7	620	449	374	600
1545	988.1	34.7	9	9.0	198	0.0	35.7	555	399	375	588
1600	988.0	34.9	8	9.1	203	0.0	33.4	519	383	348	598
1615	987.9	34.9	7	12.3	200	0.0	33.9	469	333	353	571
1630	987.8	34.8	7	8.6	209	0.0	34.1	419	301	346	557
1645	987.6	34.7	7	11.3	218	0.0	33.4	371	292	353	542
1700	987.7	34.3	6	7.3	205	0.0	35.8	308	231	341	550
1715	987.6	34.3	7	4.9	200	0.0	29.7	261	181	354	537
1730	987.5	34.4	6	9.0	203	0.0	33.1	203	151	344	525
1745	987.5	34.1	6	7.6	223	0.0	31.0	143	103	333	522
1800	987.5	33.6	7	7.0	216	0.0	32.1	82	71	343	508
1815	987.4	33.1	7	6.8	214	0.0	30.4	46	17	337	508
1830	987.3	33.8	6	6.5	237	0.0	37.7	7	0	337	480
1845	987.2	32.0	9	4.4	267	0.0	34.5	0	0	338	481
1900	987.1	31.4	10	4.1	276	0.0	34.8	0	0	343	477
1915	986.9	30.9	10	2.7	257	0.0	35.3	0	0	340	474
1930	986.8	30.6	11	2.7	265	0.0	35.3	0	0	344	477
1945	986.8	29.7	12	0.5	196	0.0	46.6	0	0	341	481
2000	986.8	29.0	13	0.1	180	0.0	37.9	0	0	340	456
2015	986.6	28.3	14	2.5	185	0.0	35.3	0	0	344	464
2030	986.6	27.9	14	0.7	83	0.0	36.4	0	0	337	450
2045	986.8	27.3	13	1.2	30	0.0	37.1	0	0	338	448
2100	986.6	26.5	16	0.0	32	0.0	36.9	0	0	322	438
2115	986.8	25.7	17	1.9	88	0.0	38.2	0	0	332	451
2130	986.8	27.1	16	2.5	239	0.0	41.8	0	0	336	457
2145	986.8	27.1	17	2.2	242	0.0	37.4	0	0	340	486
2200	986.8	26.2	20	3.9	294	0.0	40.3	0	0	342	450
2215	986.8	26.2	21	3.0	311	0.0	41.3	0	0	336	447
2230	986.8	25.4	22	3.7	294	0.0	42.2	0	0	335	448
2245	986.7	25.0	23	1.3	286	0.0	43.5	0	0	325	437
2300	986.6	24.9	24	0.0	195	0.0	46.8	0	0	326	432
2315	986.5	24.6	25	2.8	29	0.0	52.4	0	0	320	429
2330	986.5	24.1	26	2.2	157	0.0	48.4	0	0	323	437
2345	986.5	23.9	26	2.0	283	0.0	48.4	0	0	325	432
2400	986.5	24.8	26	2.4	162	0.0	47.7	0	0	334	435
AVG	987.4	28.7	19	3.6	231		38.3				
MAX	989.5	35.0	40	12.6							
MIN	985.8	21.2	6								
TOT											

382792

0.0

METEOROLOGICAL DATA  
RADAR ENVIRONMENTAL AREA  
18 sep 1990

TIME	PRESS	TEMP	REL	WD/SP	WD/DIR	PRCP	VSRY	RADIATION	WATTS/M <sup>2</sup>
Humid	mb	C	%	mph	dir	mm	km	FSP	PSP
								vert	vert
								invert	invert
15	986.5	28.1	53	4.3	196	0.0	40.9	0	0
30	986.5	27.9	54	2.2	180	0.0	46.6	0	0
45	986.5	27.3	57	2.2	227	0.0	38.7	0	0
100	986.6	27.1	55	3.4	256	0.0	46.2	0	0
115	986.6	27.6	51	6.3	249	0.0	44.8	0	0
130	986.6	27.5	24	5.4	233	0.0	46.7	0	0
145	986.6	27.4	16	4.2	237	0.0	38.8	0	0
200	986.5	27.4	18	4.0	238	0.0	37.7	0	0
215	986.5	27.2	17	3.3	241	0.0	56.2	0	0
230	986.4	27.2	17	4.4	246	0.0	34.2	0	0
245	986.3	26.8	18	4.3	247	0.0	32.4	0	0
300	986.3	26.6	19	4.9	239	0.0	32.9	0	0
315	986.3	26.4	19	4.0	246	0.0	37.2	0	0
330	986.3	26.3	19	1.9	244	0.0	31.2	0	0
345	986.1	25.7	20	1.4	324	0.0	31.3	0	0
400	986.0	25.3	21	1.0	23	0.0	29.5	0	0
415	986.0	25.0	23	0.0	35	0.0	34.2	0	0
430	985.9	24.2	24	2.4	67	0.0	30.3	0	0
445	985.8	24.2	25	3.5	59	0.0	35.5	0	0
500	985.8	23.8	26	1.8	43	0.0	33.2	0	0
515	985.8	22.9	28	0.0	47	0.0	36.7	0	0
530	985.8	22.3	30	0.0	90	0.0	33.5	0	0
545	986.0	21.9	32	0.1	40	0.0	33.4	0	0
600	986.0	21.3	32	0.0	77	0.0	34.4	0	0
615	986.1	21.3	32	1.9	29	0.0	36.3	0	0
630	986.2	21.6	33	2.9	48	0.0	33.8	1	0
645	986.3	21.3	35	2.3	36	0.0	33.5	13	19
700	986.5	21.4	34	1.0	21	0.0	33.5	23	38
715	986.8	22.3	32	0.1	29	0.0	34.1	138	75
730	987.1	23.7	31	1.4	40	0.0	34.7	143	135
745	987.4	25.0	26	0.8	25	0.0	35.7	149	135
800	987.7	25.1	26	0.2	30	0.0	37.5	116	88
815	987.8	26.0	23	1.3	25	0.0	37.4	319	210
830	988.0	26.9	21	2.7	290	0.0	50.9	386	287
845	988.2	27.8	19	0.4	299	0.0	32.6	426	329
900	988.3	28.1	18	0.4	289	0.0	63.7	489	358
915	988.7	29.0	14	1.9	242	0.0	41.0	531	351
930	989.0	29.6	14	0.8	234	0.0	45.4	583	394
945	989.2	29.7	12	4.4	269	0.0	32.5	623	487
1000	989.3	30.0	12	4.4	269	0.0	35.6	601	423
1015	989.3	30.1	13	4.0	242	0.0	34.5	633	467
1030	989.3	30.3	13	2.4	239	0.0	35.1	701	525
1045	989.4	30.6	13	4.1	189	0.0	49.8	784	576
1100	989.4	31.0	13	1.9	201	0.0	37.7	817	617
1115	989.4	31.3	13	0.5	186	0.0	51.5	826	682
1130	989.3	31.7	14	5.0	227	0.0	36.0	853	659
1145	989.5	31.8	14	5.9	198	0.0	45.4	846	664
1200	989.4	32.3	14	6.7	218	0.0	35.4	899	685
1215	989.4	32.2	14	3.7	220	0.0	33.9	895	678
1230	989.3	32.6	15	5.1	186	0.0	36.2	896	685
1245	989.3	32.8	15	6.1	203	0.0	33.4	915	680
1300	989.2	32.8	15	4.9	186	0.0	38.4	893	710
1315	989.2	32.9	15	2.4	184	0.0	36.4	892	673
1330	989.1	33.4	13	8.1	200	0.0	41.7	844	665
1345	988.9	33.8	12	5.9	212	0.0	34.1	836	674
1400	988.7	33.7	11	7.2	218	0.0	34.7	841	638



1

92/03/12  
14:58:19

20sep 15.min

METEOROLOGICAL DATA  
SADUM ENVIRONMENTAL AREA  
20 sep 1990

TIME	PRESS	TDOP	NR	WD/SP	MO/DIR	PRCP	VEBT	PSP	PSP	VERT	INVERT	VERT	INVERT	WATTS/M <sup>2</sup>
hhmm	mb	c	1	mph	dir	mm	km	vert	inert	vert	inert	vert	inert	
15	984.5	23.5	47	1.2	262	0.0	37.1	0	0	344	435			
30	984.3	23.1	47	2.9	5	0.0	37.6	0	0	344	440			
45	984.6	23.2	46	0.0	60	0.0	36.7	0	0	338	431			
100	984.6	23.2	49	0.4	78	0.0	44.8	0	0	346	430			
115	984.5	23.4	49	2.3	68	0.0	37.0	0	0	341	436			
130	984.5	23.8	50	1.0	21	0.0	35.9	0	0	343	430			
145	984.4	23.7	49	2.9	36	0.0	34.2	0	0	351	427			
200	984.3	23.3	51	2.0	28	0.0	34.2	0	0	343	420			
215	984.2	23.1	51	1.0	10	0.0	37.0	0	0	342	429			
230	984.2	23.1	51	1.5	357	0.0	36.3	0	0	344	419			
245	984.0	21.0	51	1.3	19	0.0	34.3	0	0	342	423			
300	983.9	20.8	52	1.1	350	0.0	34.3	0	0	345	421			
315	983.8	20.9	53	1.8	4	0.0	33.8	0	0	341	422			
330	983.6	20.8	53	1.4	29	0.0	34.6	0	0	341	420			
345	983.6	20.4	53	5.0	60	0.0	32.4	0	0	342	421			
400	983.3	20.4	54	3.2	27	0.0	37.8	0	0	342	424			
415	983.4	20.2	56	3.1	36	0.0	30.5	0	0	348	416			
430	983.7	20.2	56	2.7	15	0.0	31.2	0	0	342	419			
445	983.7	20.4	56	3.1	21	0.0	34.4	0	0	340	418			
500	983.8	20.3	56	4.1	30	0.0	34.0	0	0	340	416			
515	984.0	20.3	57	4.3	32	0.0	34.3	0	0	342	417			
530	984.1	20.1	57	3.8	27	0.0	34.3	0	0	342	410			
545	984.3	20.5	56	4.4	27	0.0	32.9	0	0	344	420			
600	984.3	20.5	53	2.9	23	0.0	31.3	0	0	345	421			
615	984.3	20.4	53	2.9	23	0.0	31.3	0	0	344	419			
630	984.4	20.4	53	3.2	26	0.0	30.1	18	13	344	426			
645	984.6	21.4	44	4.0	45	0.0	32.4	55	43	377	434			
700	984.7	22.1	44	4.0	45	0.0	32.4	61	43	367	438			
715	984.9	22.4	43	3.8	34	0.0	38.9	85	40	375	443			
730	985.1	23.1	42	4.1	34	0.0	34.0	102	74	370	453			
745	985.3	24.6	36	5.0	53	0.0	34.0	133	103	376	464			
800	985.3	25.3	33	4.5	79	0.0	41.6	170	129	387	453			
815	985.6	25.3	33	4.5	79	0.0	41.6	170	129	387	453			
830	986.0	26.1	32	3.4	78	0.0	32.0	213	141	399	480			
845	986.3	26.3	33	3.2	105	0.0	35.7	277	204	379	474			
860	986.6	26.4	34	3.3	138	0.0	33.3	286	232	401	486			
900	986.9	26.8	33	3.2	128	0.0	34.6	629	474	375	515			
915	986.9	26.8	33	3.2	128	0.0	34.6	629	474	375	515			
930	987.1	28.0	33	6.6	111	0.0	50.3	607	438	381	531			
945	987.3	28.2	33	7.9	99	0.0	38.3	620	470	373	543			
1000	987.5	28.9	34	11.1	97	0.0	34.9	620	470	373	543			
1015	987.6	29.0	31	5.8	99	0.0	35.9	719	508	400	563			
1030	987.6	29.6	30	9.6	94	0.0	40.6	679	508	394	565			
1045	987.7	27.5	29	7.3	92	0.0	36.8	424	297	388	556			
1100	987.6	29.7	30	10.3	88	0.0	39.3	882	665	386	572			
1115	987.6	30.0	29	8.1	96	0.0	48.5	305	695	400	587			
1130	987.6	29.8	28	7.7	99	0.0	59.1	935	721	390	600			
1145	987.6	29.6	28	7.7	82	0.0	37.6	866	674	399	577			
1200	987.5	29.9	24	10.7	108	0.0	36.3	899	690	388	595			
1215	987.5	30.3	26	8.6	109	0.0	34.7	912	688	402	600			
1230	987.4	30.3	26	7.7	90	0.0	37.1	936	713	372	607			
1245	987.4	30.5	27	9.2	68	0.0	36.0	955	778	406	614			
1300	987.3	31.1	27	8.5	82	0.0	42.8	778	599	401	612			
1315	987.4	30.9	26	7.5	79	0.0	36.6	911	733	410	613			
1330	987.3	30.8	24	7.1	79	0.0	50.5	915	700	406	628			
1345	987.3	31.6	24	6.9	80	0.0	38.1	928	636	388	601			
1400	987.1	31.6	27	13.6	74	0.0	38.1	928	636	388	601			

347330

0.0

79

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17

17



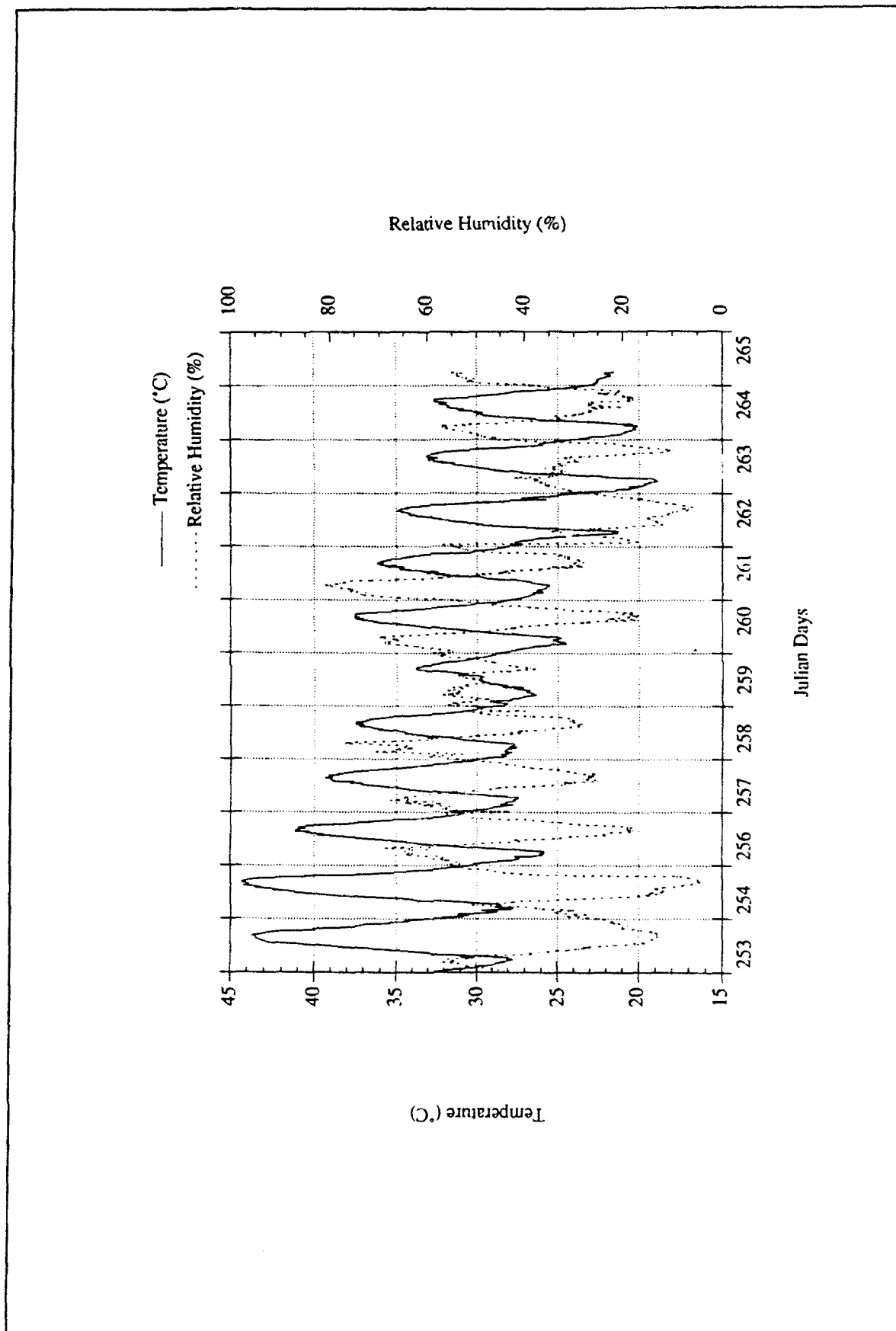


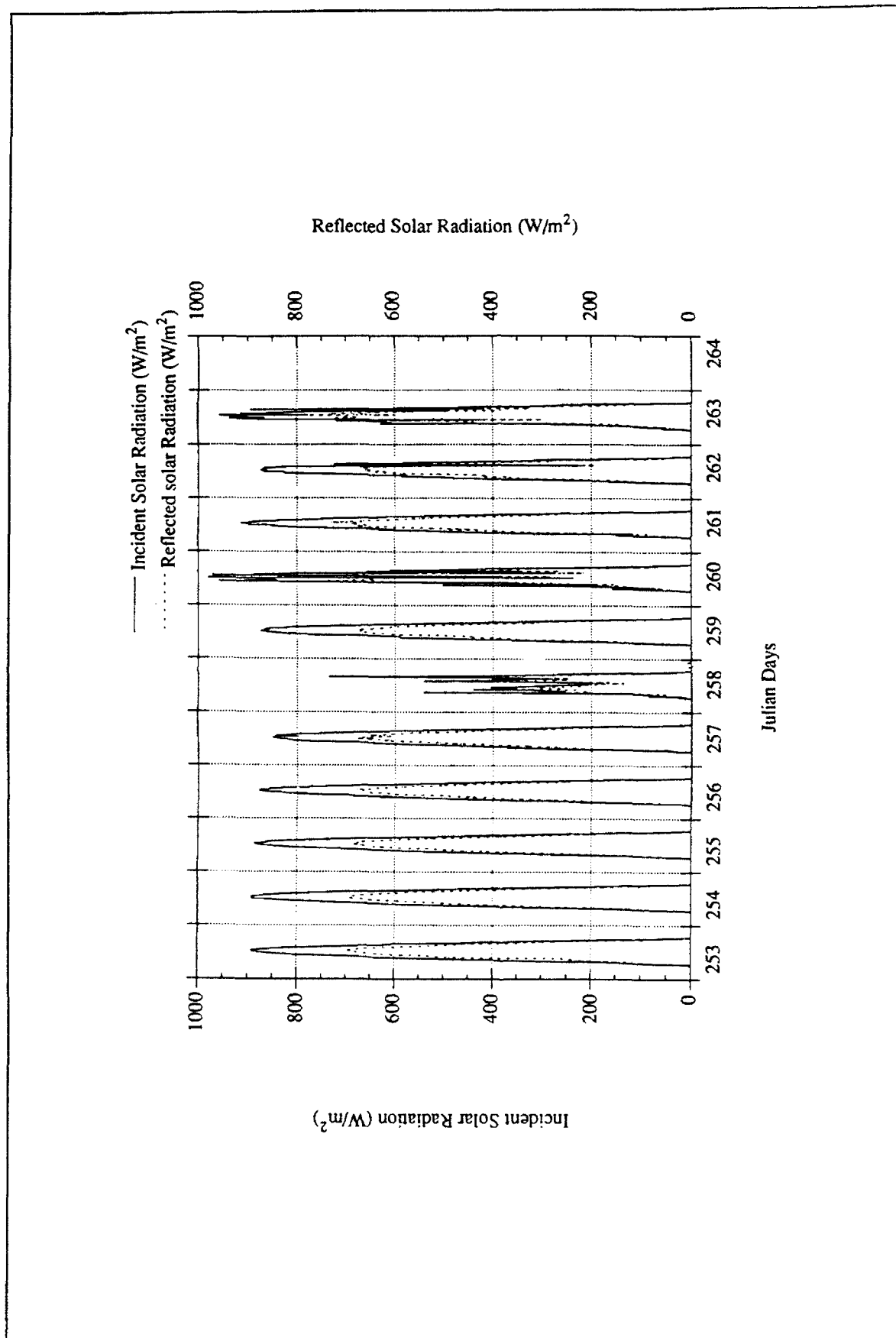
21sep\_15.min

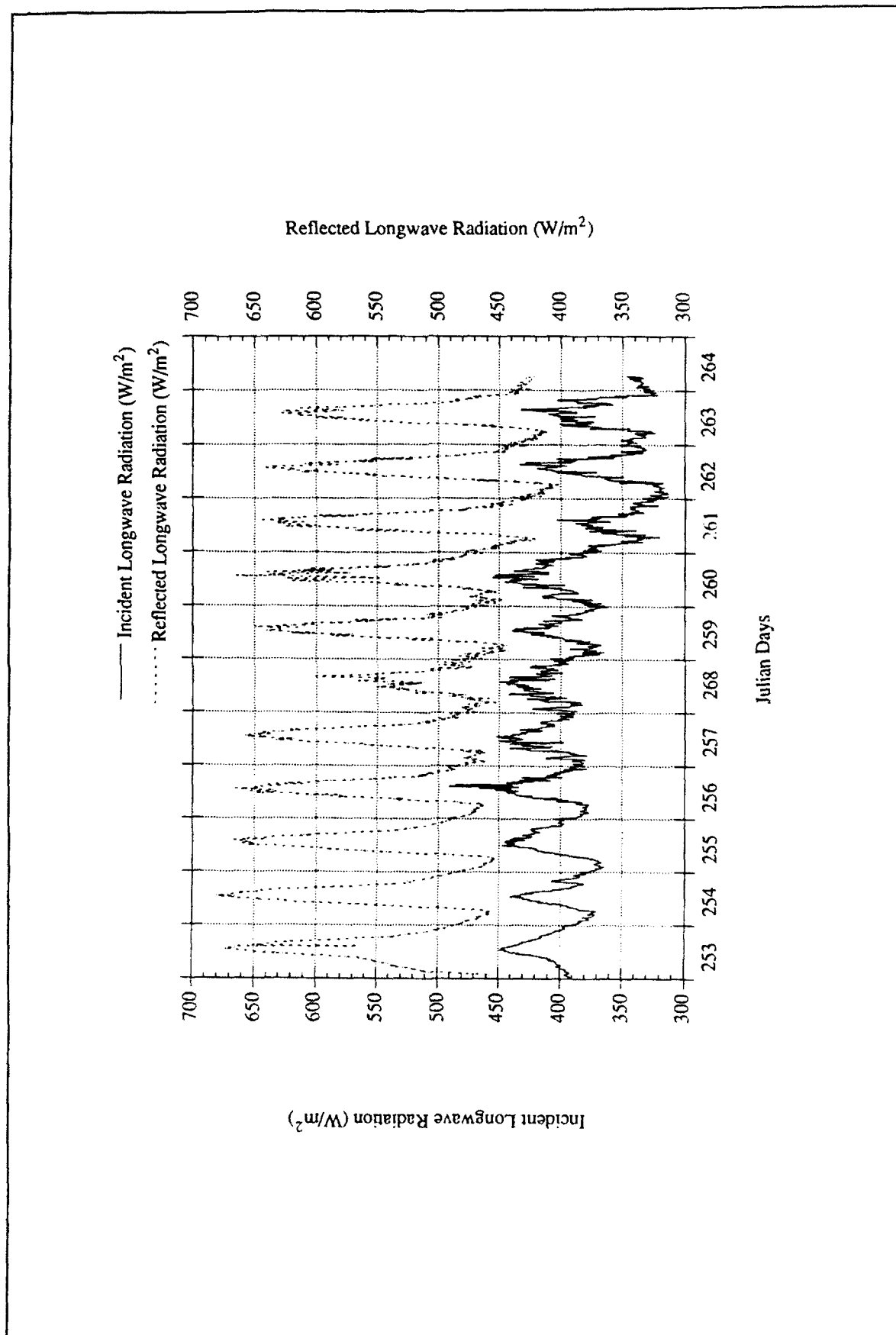
92/03/12  
14:58:31

METEOROLOGICAL DATA  
SADARM ENVIRONMENTAL AREA  
21 sep 1990

TIME	PRESS	TEMP	RH	WD/SP	WD/DIR	PRCP	VBRT	RADIATION				WATTS/M <sup>2</sup>
								PSP	PSP	PSP	PSP	
min	mb		%	deg	deg	mm	km	vert	horiz	vert	horiz	
15	987.5	22.8	39	4.5	78	0.0	35.4	0	0	333	424	
30	987.4	22.8	43	6.4	70	0.0	32.8	0	0	331	434	
45	987.7	22.6	48	6.4	72	0.0	30.8	0	0	328	431	
100	987.0	22.7	50	7.6	79	0.0	34.2	0	0	339	432	
115	987.5	22.5	50	6.8	79	0.0	31.8	0	0	336	432	
130	988.0	22.5	51	5.5	73	0.0	34.7	0	0	337	433	
145	988.0	22.5	52	7.1	73	0.0	34.7	0	0	329	436	
200	987.9	22.6	51	8.1	70	0.0	32.3	0	0	338	433	
215	987.5	22.6	50	8.7	70	0.0	33.2	0	0	336	432	
230	987.9	22.5	50	6.4	74	0.0	33.0	0	0	335	428	
245	987.5	22.4	52	7.4	78	0.0	34.7	0	0	336	429	
300	987.8	22.4	52	10.4	88	0.0	34.8	0	0	334	431	
315	987.5	22.1	52	9.3	86	0.0	33.0	0	0	334	433	
330	987.9	22.1	53	8.9	86	0.0	35.5	0	0	333	431	
345	987.5	22.0	53	5.9	81	0.0	39.2	0	0	335	425	
400	988.0	21.8	54	7.0	85	0.0	33.5	0	0	336	426	
415	988.0	21.7	54	6.4	83	0.0	32.3	0	0	341	424	
430	988.0	21.8	54	6.7	83	0.0	34.2	0	0	335	424	
445	988.1	21.8	54	6.2	83	0.0	34.2	0	0	348	424	
500	988.2	22.1	53	7.4	78	0.0	32.8	0	0	340	428	
515	988.3	22.1	53	6.4	81	0.0	33.8	0	0	333	428	
530	988.4	21.8	54	6.8	86	0.0	33.0	0	0	336	426	
545	988.5	21.6	55	7.5	87	0.0	33.4	0	0	335	425	
600	988.7	21.5	56	7.6	95	0.0	38.6	0	0	346	422	
AVG	988.0	22.2	51	7.3	80							
MAX	988.9	23.0	56	10.6								
MIN	987.4	21.3	38									
TOT						0.0						







## **Appendix B**

### **Soil Temperature Profile Data**

---

The following pages list soil temperatures (physical) recorded at several depths below the surface in two soil pits located within the Control Site near the Sense and Destroy Armor test area, Yuma Proving Ground, AZ. These data were collected during a 2-week period in September 1990. As with the data in Appendix A, these tabulations represent 15-min averages of 1-min data. Temperatures were measured with waterproof thermistors. The column headings indicate the approximate depth beneath the soil surface at which each thermistor bead was located.

There are two sets of tabulated data in this Appendix. One is identified by the ".wbk" notation and represents data collected in the wash bank pit. The other set is identified by the ".spf" notation and represents data collected in the pit located outside of the desert wash.

1

07sep90.wbk

9/20/92  
14:52:43

THEMISTOR DATA  
WASHDAK PROFILE  
SADAM ENVIRONMENTAL AREA  
07 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hr:min	deg c	deg c	deg c	deg c	deg c	deg c	deg c
1415	36.7	36.5	36.0	34.7	32.2	32.3	33.2
1430	37.9	36.7	36.0	34.7	32.3	32.3	33.2
1445	37.6	37.0	36.2	34.7	32.3	32.3	33.2
1500	35.5	37.0	36.3	34.8	32.4	32.3	33.3
1515	35.0	36.8	36.1	34.9	32.5	32.3	33.3
1530	34.4	36.5	35.8	34.9	32.5	32.3	33.3
1545	34.0	36.2	35.6	34.9	32.6	32.3	33.2
1600	34.1	35.9	35.3	34.9	32.7	32.3	33.3
1615	33.8	35.5	35.0	34.8	32.8	32.3	33.3
1630	32.4	35.1	34.7	34.7	32.8	32.3	33.3
1645	31.3	34.4	34.2	34.6	32.9	32.3	33.3
1700	29.7	33.7	33.5	34.4	32.9	32.3	33.2
1715	29.3	33.0	32.9	34.3	32.9	32.3	33.2
1730	29.5	32.5	32.4	32.9	33.0	32.3	33.2
1745	29.4	32.1	32.1	33.7	33.1	32.4	33.3
1800	29.2	31.8	31.8	33.4	33.1	32.4	33.3
1815	29.0	31.4	31.5	33.2	33.1	32.4	33.3
1830	28.6	31.1	31.2	32.9	33.0	32.4	33.2
1845	28.2	30.8	30.9	32.7	33.0	32.4	33.2
1900	28.1	30.5	30.6	32.5	33.0	32.4	33.2
1915	27.5	30.2	30.3	32.2	32.9	32.4	33.2
1930	27.0	29.9	30.0	32.1	32.9	32.5	33.2
1945	27.2	29.5	29.8	31.9	32.9	32.5	33.2
2000	27.4	29.4	29.6	31.6	32.8	32.5	33.2
2015	27.2	29.2	29.4	31.4	32.7	32.5	33.2
2030	27.2	29.1	29.2	31.2	32.7	32.5	33.2
2045	27.2	29.0	29.1	31.1	32.6	32.5	33.1
2100	27.2	28.9	29.0	30.9	32.5	32.5	33.1
2115	27.1	28.8	29.0	30.8	32.5	32.5	33.1
2130	27.0	28.7	28.9	30.7	32.4	32.5	33.2
2145	27.0	28.5	28.7	30.6	32.4	32.5	33.1
2200	27.0	28.5	28.6	30.5	32.3	32.5	33.1
2215	27.0	28.4	28.5	30.3	32.2	32.5	33.1
2230	26.9	28.3	28.5	30.2	32.1	32.5	33.1
2245	26.8	28.2	28.3	30.1	32.1	32.5	33.1
2300	26.9	28.1	28.3	30.0	32.0	32.5	33.1
2315	26.8	28.1	28.2	29.9	31.9	32.5	33.1
2330	26.6	28.0	28.2	29.8	31.9	32.5	33.1
2345	26.5	27.9	28.1	29.8	31.8	32.5	33.1
2400	26.4	27.8	28.0	29.7	31.8	32.5	33.1

92/03/12  
14:52:53

TEMPERATURE DATA  
WASHBURN PROFILE  
SADAM ENVIRONMENTAL AREA  
08 SEP 1990

TIME	0.0m	-2.5m	-5.0m	-10.0m	-20.0m	-40.0m	-70.0m
h:m:s	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	26.2	27.7	27.9	29.4	31.7	32.5	33.1
0030	26.1	27.6	27.7	29.5	31.6	32.5	33.1
0045	26.0	27.4	27.6	29.4	31.6	32.5	33.1
0100	25.9	27.3	27.5	29.3	31.5	32.5	33.1
0115	25.8	27.3	27.4	29.2	31.4	32.5	33.1
0130	25.8	27.2	27.4	29.1	31.4	32.5	33.1
0145	25.9	27.1	27.3	29.0	31.3	32.5	33.1
0200	25.7	27.0	27.2	28.9	31.2	32.5	33.1
0215	25.6	26.9	27.1	28.8	31.2	32.4	33.0
0230	25.5	26.9	27.0	28.8	31.1	32.4	33.0
0245	25.3	26.7	26.9	28.7	31.0	32.4	33.0
0300	25.1	26.6	26.8	28.6	31.0	32.4	33.0
0315	25.1	26.5	26.7	28.5	30.9	32.4	33.0
0330	25.1	26.4	26.6	28.4	30.9	32.4	33.0
0345	25.0	26.4	26.6	28.4	30.8	32.3	33.0
0400	25.0	26.3	26.5	28.3	30.8	32.4	33.1
0415	25.0	26.3	26.5	28.2	30.9	32.4	33.1
0430	24.9	26.2	26.4	28.2	30.7	32.3	33.0
0445	24.8	26.1	26.3	28.1	30.6	32.3	33.0
0500	24.7	26.0	26.2	28.0	30.5	32.3	33.0
0515	24.7	26.0	26.2	28.0	30.5	32.3	33.0
0530	24.6	25.9	26.1	27.9	30.5	32.3	33.0
0545	24.5	25.8	26.0	27.8	30.4	32.3	33.0
0600	24.5	25.7	26.0	27.7	30.4	32.3	33.0
0615	24.4	25.7	25.9	27.6	30.3	32.3	33.0
0630	24.3	25.6	25.8	27.5	30.2	32.3	33.0
0645	24.3	25.6	25.8	27.5	30.2	32.3	33.0
0700	24.2	25.5	25.8	27.4	30.1	32.3	33.0
0715	24.1	25.4	25.7	27.3	30.1	32.3	33.0
0730	24.0	25.3	25.6	27.2	30.0	32.2	33.0
0745	24.0	25.3	25.6	27.1	30.0	32.2	33.0
0800	24.0	25.2	25.5	27.0	30.0	32.2	33.0
0815	23.9	25.1	25.4	26.9	29.9	32.1	32.9
0830	23.9	25.0	25.3	26.8	29.8	32.1	32.9
0845	23.8	24.9	25.2	26.7	29.8	32.1	32.9
0900	23.7	24.8	25.1	26.6	29.7	32.0	32.8
0915	23.7	24.7	25.0	26.5	29.6	32.0	32.8
0930	23.6	24.6	24.9	26.4	29.5	32.0	32.8
0945	23.5	24.5	24.8	26.3	29.4	32.0	32.8
1000	23.4	24.4	24.7	26.2	29.3	32.0	32.8
1015	23.3	24.3	24.6	26.1	29.2	32.0	32.8
1030	23.2	24.2	24.5	26.0	29.1	32.0	32.8
1045	23.1	24.1	24.4	25.9	29.0	32.0	32.8
1100	23.0	24.0	24.3	25.8	28.9	32.0	32.8
1115	22.9	23.9	24.2	25.7	28.8	32.0	32.8
1130	22.8	23.8	24.1	25.6	28.7	32.0	32.8
1145	22.7	23.7	24.0	25.5	28.6	32.0	32.8
1200	22.6	23.6	23.9	25.4	28.5	32.0	32.8
1215	22.5	23.5	23.8	25.3	28.4	32.0	32.8
1230	22.4	23.4	23.7	25.2	28.3	32.0	32.8
1245	22.3	23.3	23.6	25.1	28.2	32.0	32.8
1300	22.2	23.2	23.5	25.0	28.1	32.0	32.8
1315	22.1	23.1	23.4	24.9	28.0	32.0	32.8
1330	22.0	23.0	23.3	24.8	27.9	32.0	32.8
1345	21.9	22.9	23.2	24.7	27.8	32.0	32.8
1400	21.8	22.8	23.1	24.6	27.7	32.0	32.8

1

08sep90.wbk

1415	45.1	40.9	40.3	37.6	32.3	31.8	32.9
1430	44.0	41.0	40.4	37.9	32.5	31.8	32.9
1445	43.7	40.9	40.3	38.1	32.6	31.8	32.9
1500	42.8	40.8	40.3	38.2	32.8	31.8	32.8
1515	42.1	40.8	40.3	38.4	33.0	31.8	32.8
1530	41.0	40.5	40.1	38.5	33.2	31.8	32.8
1545	41.5	40.3	39.9	38.6	33.3	31.8	32.8
1600	40.5	39.9	39.6	38.6	33.5	31.8	32.8
1615	39.7	39.3	39.1	38.5	33.7	31.9	32.8
1630	39.1	38.7	38.4	38.4	33.8	31.9	32.8
1645	38.4	38.0	37.9	38.3	34.0	31.9	32.7
1700	38.1	37.0	37.2	38.0	34.1	31.9	32.7
1715	38.1	36.1	36.5	37.7	34.2	31.9	32.7
1730	38.5	35.6	35.9	37.4	34.3	32.0	32.8
1745	38.7	34.9	35.3	37.0	34.4	32.0	32.8
1800	38.2	34.3	34.7	36.7	34.4	32.0	32.8
1815	38.7	33.8	34.2	36.3	34.4	32.1	32.9
1830	38.1	33.3	33.7	35.9	34.4	32.1	32.7
1845	38.5	32.9	33.2	35.6	34.4	32.1	32.7
1900	38.1	32.4	32.8	35.2	34.4	32.2	32.7
1915	39.8	32.1	32.4	34.9	34.5	32.2	32.7
1930	39.4	31.8	32.1	34.8	34.5	32.2	32.7
1945	39.7	31.4	31.7	34.3	34.3	32.3	32.7
2000	38.7	31.0	31.3	34.0	34.2	32.3	32.7
2015	38.6	30.5	31.0	33.7	34.1	32.3	32.7
2030	38.2	30.3	30.8	33.4	34.0	32.3	32.7
2045	38.1	30.2	30.5	33.1	34.0	32.4	32.7
2100	38.1	30.1	30.3	32.9	33.9	32.4	32.7
2115	37.9	29.9	30.1	32.7	33.8	32.4	32.7
2130	37.7	29.6	29.8	32.6	33.7	32.5	32.7
2145	37.5	29.4	29.7	32.4	33.6	32.5	32.7
2200	37.3	29.4	29.7	32.2	33.6	32.5	32.7
2215	37.1	29.0	29.3	32.1	33.6	32.5	32.7
2230	36.8	28.7	29.0	31.9	33.5	32.5	32.7
2245	36.6	28.7	28.9	31.8	33.5	32.6	32.7
2300	36.1	28.4	28.7	31.5	33.2	32.6	32.7
2315	36.1	28.3	28.5	31.4	33.2	32.6	32.7
2330	36.1	28.0	28.2	31.3	33.2	32.6	32.7
2345	36.1	27.9	28.1	31.3	33.2	32.6	32.7
2400	36.0	27.8	28.0	31.2	33.2	32.6	32.7

09sep90.wbk

92/03/12  
15:02:59

THEMISTOR DATA  
WATERBANK PROFILE AREA  
09 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	25.7	27.6	27.9	30.3	32.7	32.6	32.7
0030	25.1	27.4	27.7	30.3	32.6	32.6	32.7
0045	25.2	27.2	27.5	30.0	32.5	32.6	32.7
0100	25.3	27.1	27.3	29.8	32.4	32.6	32.7
0115	25.3	27.0	27.2	29.7	32.2	32.6	32.7
0130	25.2	26.9	27.2	29.5	32.2	32.6	32.7
0145	25.1	26.8	27.1	29.4	32.1	32.6	32.7
0200	25.0	26.6	27.0	29.3	32.0	32.7	32.7
0215	24.7	26.6	26.9	29.2	31.9	32.7	32.7
0230	24.7	26.5	26.7	29.1	31.9	32.6	32.7
0245	24.6	26.3	26.4	28.9	31.8	32.6	32.7
0300	24.4	26.2	26.5	28.8	31.7	32.6	32.7
0315	24.3	26.1	26.4	28.7	31.6	32.6	32.7
0330	24.3	26.0	26.2	28.6	31.5	32.6	32.7
0345	24.2	25.9	26.1	28.5	31.4	32.6	32.7
0400	24.1	25.8	26.1	28.3	31.3	32.5	32.7
0415	24.1	25.7	26.0	28.2	31.2	32.5	32.7
0430	24.0	25.6	25.9	28.1	31.1	32.5	32.7
0445	23.9	25.5	25.8	28.0	31.1	32.5	32.7
0500	23.6	25.4	25.7	27.9	31.0	32.5	32.7
0515	23.5	25.3	25.6	27.8	30.9	32.5	32.7
0530	23.4	25.2	25.4	27.7	30.8	32.5	32.7
0545	23.4	25.1	25.4	27.6	30.7	32.5	32.7
0600	23.4	25.0	25.3	27.5	30.7	32.4	32.7
0615	23.2	24.9	25.2	27.4	30.6	32.4	32.7
0630	23.2	24.8	25.1	27.3	30.5	32.4	32.7
0645	23.1	24.8	25.0	27.2	30.4	32.4	32.7
0700	23.1	24.7	25.0	27.1	30.4	32.3	32.7
0715	23.0	24.6	24.9	27.1	30.3	32.3	32.7
0730	22.9	24.5	24.8	27.0	30.2	32.3	32.7
0745	22.8	24.4	24.7	26.9	30.2	32.3	32.7
0800	22.8	24.3	24.6	26.8	30.1	32.3	32.7
0815	22.7	24.2	24.5	26.7	30.0	32.3	32.7
0830	22.7	24.1	24.4	26.6	30.0	32.3	32.7
0845	22.6	24.0	24.3	26.5	29.9	32.3	32.7
0900	22.6	23.9	24.2	26.4	29.8	32.3	32.7
0915	22.5	23.8	24.1	26.3	29.7	32.3	32.7
0930	22.5	23.7	24.0	26.2	29.6	32.3	32.7
0945	22.4	23.6	23.9	26.1	29.5	32.3	32.7
1000	22.4	23.5	23.8	26.0	29.4	32.3	32.7
1015	22.3	23.4	23.7	25.9	29.3	32.3	32.7
1030	22.3	23.3	23.6	25.8	29.2	32.3	32.7
1045	22.2	23.2	23.5	25.7	29.1	32.3	32.7
1100	22.2	23.1	23.4	25.6	29.0	32.3	32.7
1115	22.1	23.0	23.3	25.5	28.9	32.3	32.7
1130	22.1	22.9	23.2	25.4	28.8	32.3	32.7
1145	22.0	22.8	23.1	25.3	28.7	32.3	32.7
1200	22.0	22.7	23.0	25.2	28.6	32.3	32.7
1215	21.9	22.6	22.9	25.1	28.5	32.3	32.7
1230	21.8	22.5	22.8	25.0	28.4	32.3	32.7
1245	21.7	22.4	22.7	24.9	28.3	32.3	32.7
1300	21.6	22.3	22.6	24.8	28.2	32.3	32.7
1315	21.5	22.2	22.5	24.7	28.1	32.3	32.7
1330	21.4	22.1	22.4	24.6	28.0	32.3	32.7
1345	21.3	22.0	22.3	24.5	27.9	32.3	32.7
1400	21.3	21.9	22.2	24.4	27.8	32.3	32.6

1415	47.1	42.3	41.7	38.4	32.5	31.9	32.7
1430	46.7	42.5	41.8	38.0	32.7	31.9	32.7
1445	45.8	42.5	41.9	38.0	32.9	31.9	32.7
1500	44.4	42.4	41.8	38.2	31.2	31.9	32.7
1515	43.8	42.3	41.7	38.4	31.4	31.9	32.7
1530	43.7	42.1	41.6	38.5	31.6	31.9	32.7
1545	43.4	41.8	41.4	38.5	31.8	31.9	32.7
1600	42.7	41.5	41.1	38.4	31.9	31.9	32.7
1615	41.7	41.0	40.7	38.5	34.1	32.0	32.6
1630	39.9	40.4	40.2	38.5	34.3	32.0	32.6
1645	38.1	39.5	39.3	38.5	34.6	32.0	32.6
1700	36.7	38.5	38.7	38.7	34.5	32.0	32.6
1715	35.8	37.7	37.9	38.7	34.7	32.0	32.6
1730	35.0	36.9	37.2	38.3	34.8	32.0	32.6
1745	34.3	36.3	36.6	38.0	34.8	32.1	32.6
1800	33.8	35.8	36.1	37.7	34.9	32.2	32.7
1815	33.2	35.2	35.6	37.3	35.0	32.2	32.6
1830	32.7	34.7	35.1	36.9	35.0	32.2	32.6
1845	32.1	34.2	34.6	36.5	35.0	32.2	32.6
1900	31.8	33.8	34.1	36.2	34.9	32.3	32.6
1915	31.5	33.3	33.7	35.8	34.8	32.3	32.6
1930	31.0	33.0	33.2	35.3	34.8	32.3	32.6
1945	30.6	32.7	33.0	35.2	34.8	32.4	32.6
2000	30.4	32.3	32.7	35.0	34.7	32.4	32.6
2015	30.4	32.0	32.4	34.7	34.7	32.5	32.6
2030	30.4	31.6	32.1	34.4	34.6	32.5	32.6
2045	29.6	31.5	31.8	34.1	34.5	32.5	32.5
2100	29.0	31.2	31.5	33.8	34.4	32.5	32.5
2115	28.4	30.9	31.2	33.4	34.4	32.6	32.6
2130	28.4	30.6	31.0	33.4	34.3	32.6	32.6
2145	28.3	30.4	30.7	33.2	34.2	32.7	32.6
2200	28.1	30.2	30.5	32.9	34.1	32.7	32.6
2215	28.0	30.0	30.3	32.7	34.0	32.7	32.6
2230	27.8	29.8	30.1	32.5	33.9	32.7	32.6
2245	27.7	29.6	29.9	32.3	33.8	32.7	32.6
2300	27.4	29.4	29.7	32.1	33.7	32.7	32.5
2315	27.4	29.2	29.5	31.9	33.6	32.7	32.5
2330	27.0	29.0	29.3	31.8	33.5	32.7	32.5
2345	26.9	28.9	29.2	31.6	33.4	32.7	32.5
2400	26.6	28.7	28.9	31.4	33.3	32.7	32.5



92/03/12  
15:03:44

10sep90.wbk

1

THEMISTOR DATA  
WASHINGTON PROFILE  
SADAM ENVIRONMENTAL AREA  
10 SEP 1990

TIME	0.0m	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	26.6	28.7	28.9	31.4	32.3	32.7	32.5
0030	26.3	28.4	28.6	31.1	32.2	32.8	32.6
0045	26.3	28.2	28.5	31.0	32.1	32.8	32.6
0100	26.3	28.1	28.4	30.8	32.0	32.8	32.6
0115	26.4	28.0	28.3	30.6	32.0	32.8	32.6
0130	26.3	27.9	28.2	30.5	32.0	32.8	32.6
0145	26.1	27.8	28.0	30.4	32.0	32.8	32.6
0200	26.0	27.7	27.9	30.2	32.0	32.8	32.6
0215	25.9	27.5	27.8	30.1	32.0	32.8	32.6
0230	25.6	27.4	27.6	30.0	32.0	32.8	32.6
0245	25.5	27.2	27.5	29.8	32.0	32.8	32.6
0300	25.5	27.1	27.4	29.7	32.0	32.8	32.6
0315	25.3	27.0	27.3	29.6	32.0	32.8	32.6
0330	25.3	26.9	27.1	29.4	32.0	32.7	32.5
0345	25.2	26.8	27.0	29.3	32.0	32.7	32.5
0400	25.1	26.8	27.0	29.2	31.9	32.6	32.6
0415	25.0	26.6	26.9	29.1	31.9	32.6	32.6
0430	24.8	26.5	26.8	29.0	31.8	32.7	32.6
0445	24.6	26.4	26.6	28.9	31.7	32.7	32.6
0500	24.5	26.2	26.5	28.8	31.6	32.7	32.6
0515	24.5	26.1	26.4	28.7	31.5	32.7	32.6
0530	24.4	26.0	26.3	28.6	31.4	32.7	32.6
0545	24.2	25.9	26.2	28.4	31.4	32.7	32.6
0600	24.0	25.8	26.1	28.3	31.3	32.7	32.6
0615	24.0	25.7	26.0	28.2	31.2	32.7	32.6
0630	24.0	25.6	25.9	28.1	31.1	32.6	32.6
0645	24.1	25.5	25.8	28.0	31.0	32.6	32.6
0700	25.0	25.6	25.9	27.9	31.0	32.6	32.6
0715	26.1	26.1	26.1	27.9	30.9	32.6	32.6
0730	27.4	26.4	26.5	27.8	30.8	32.5	32.6
0745	29.0	27.0	27.0	27.8	30.8	32.5	32.7
0800	30.1	27.7	27.7	28.0	30.7	32.5	32.6
0815	30.1	28.4	28.3	28.2	30.6	32.5	32.6
0830	31.7	29.7	29.7	28.9	30.5	32.5	32.6
0845	31.8	30.4	30.4	29.5	30.5	32.5	32.7
0900	31.9	31.2	31.2	30.1	30.5	32.5	32.7
0915	32.0	31.0	30.8	29.5	30.5	32.5	32.7
0930	32.0	31.0	30.8	29.5	30.5	32.5	32.7
0945	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1000	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1015	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1030	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1045	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1100	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1115	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1130	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1145	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1200	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1215	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1230	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1245	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1300	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1315	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1330	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1345	32.0	31.0	30.8	29.5	30.5	32.5	32.7
1400	32.0	31.0	30.8	29.5	30.5	32.5	32.7

1415	49.5	44.4	43.5	39.8	31.2	32.2	32.7
1430	49.2	44.5	43.6	40.2	31.6	32.2	32.7
1445	48.0	44.6	43.7	40.4	32.0	32.2	32.7
1500	46.7	44.5	43.6	40.6	34.0	32.2	32.7
1515	46.1	44.4	43.6	40.8	34.3	32.2	32.7
1530	46.0	44.2	43.4	40.9	34.5	32.2	32.7
1545	45.6	43.9	43.2	41.0	34.7	32.2	32.7
1600	44.9	43.6	43.0	41.0	34.9	32.2	32.7
1615	43.9	43.2	42.8	41.0	35.1	32.2	32.7
1630	43.3	42.5	42.1	41.0	35.3	32.2	32.7
1645	40.4	41.7	41.5	40.8	35.4	32.2	32.7
1700	39.1	40.8	40.7	40.5	35.6	32.2	32.7
1715	38.1	40.0	40.0	40.2	35.7	32.4	32.7
1730	37.4	39.2	39.2	39.9	35.8	32.4	32.6
1745	36.7	38.6	38.7	39.5	35.9	32.5	32.6
1800	36.1	38.0	38.2	39.2	35.9	32.5	32.6
1815	35.4	37.4	37.6	38.8	36.0	32.5	32.6
1830	34.9	36.9	37.1	38.4	36.0	32.5	32.6
1845	34.3	36.4	36.2	38.1	36.0	32.6	32.6
1900	33.7	36.0	36.2	37.8	36.0	32.6	32.6
1915	33.2	35.5	35.7	37.5	36.0	32.7	32.6
1930	32.7	35.0	35.3	37.1	35.9	32.7	32.6
1945	32.3	34.5	34.9	36.8	35.9	32.8	32.6
2000	31.9	34.1	34.5	36.5	35.8	32.8	32.6
2015	31.6	33.8	34.1	36.2	35.8	32.8	32.6
2030	31.2	33.5	33.8	35.9	35.7	32.9	32.6
2045	30.9	33.2	33.1	35.6	35.7	32.9	32.6
2100	30.5	32.8	33.1	35.3	35.5	33.0	32.6
2115	30.3	32.5	32.8	35.0	35.5	33.0	32.6
2130	30.0	32.2	32.5	34.8	35.4	33.0	32.6
2145	29.6	31.9	32.2	34.5	35.3	33.1	32.6
2200	29.3	31.6	32.0	34.3	35.2	33.1	32.6
2215	28.5	31.3	31.6	34.0	35.1	33.1	32.6
2230	28.2	30.9	31.3	33.7	35.0	33.1	32.6
2245	28.4	30.6	31.0	33.5	34.9	33.2	32.6
2300	28.1	30.4	30.8	33.3	34.8	33.2	32.6
2315	27.6	30.1	30.5	33.0	34.7	33.2	32.6
2330	27.5	29.8	30.2	32.8	34.6	33.2	32.6
2345	27.3	29.6	30.0	32.6	34.5	33.2	32.6
2400	27.2	29.4	29.8	32.4	34.3	33.3	32.6

92/03/12  
14:53:13

11sep90.wbk

11

TEHRISTOR DATA  
MAGNETIC PROFILE  
SADAM ENVIRONMENTAL AREA  
11 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hum	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	27.0	29.2	29.5	32.2	34.2	33.3	32.6
0030	26.8	29.0	29.4	32.0	34.2	33.3	32.6
0045	26.5	28.8	29.2	31.6	34.0	33.3	32.7
0100	26.1	28.6	29.0	31.6	33.9	33.3	32.7
0115	25.8	28.3	28.7	31.4	33.8	33.3	32.7
0130	25.6	28.1	28.5	31.2	33.7	33.3	32.7
0145	25.5	27.9	28.3	31.0	33.6	33.3	32.7
0200	25.3	27.7	28.1	30.8	33.5	33.3	32.7
0215	25.2	27.5	28.0	30.6	33.4	33.3	32.7
0230	25.1	27.3	27.7	30.4	33.2	33.3	32.7
0245	25.0	27.2	27.5	30.3	33.2	33.3	32.7
0300	24.9	27.0	27.4	30.1	33.0	33.3	32.6
0315	24.7	26.8	27.2	29.9	32.9	33.3	32.6
0330	24.6	26.6	27.1	29.8	32.9	33.3	32.6
0345	24.4	26.5	27.0	29.7	32.8	33.3	32.7
0400	24.4	26.5	26.8	29.5	32.6	33.3	32.7
0415	24.3	26.3	26.7	29.4	32.5	33.3	32.7
0430	24.1	26.2	26.5	29.2	32.4	33.3	32.7
0445	24.0	26.0	26.4	29.1	32.3	33.3	32.7
0500	23.8	25.9	26.3	28.9	32.2	33.3	32.7
0515	23.7	25.8	26.1	28.8	32.1	33.2	32.7
0530	23.6	25.6	26.0	28.7	32.0	33.2	32.7
0545	23.5	25.5	25.9	28.5	31.9	33.2	32.7
0600	23.4	25.4	25.7	28.4	31.8	33.1	32.7
0615	23.3	25.3	25.6	28.3	31.7	33.1	32.7
0630	23.3	25.2	25.5	28.1	31.6	33.1	32.7
0645	23.2	25.1	25.4	28.0	31.5	33.1	32.7
0700	23.1	25.0	25.3	27.9	31.4	33.1	32.7
0715	23.0	24.9	25.2	27.8	31.3	33.1	32.7
0730	22.7	24.6	24.9	27.6	31.3	33.1	32.7
0745	22.6	24.5	24.8	27.5	31.2	33.1	32.7
0800	22.0	23.1	23.2	26.0	31.2	33.0	32.6
0815	22.0	23.0	23.1	25.9	31.1	33.0	32.7
0830	22.0	23.0	23.1	25.9	31.1	33.0	32.7
0845	22.0	23.0	23.1	25.9	31.1	33.0	32.7
0900	22.0	23.0	23.1	25.9	31.1	33.0	32.7
0915	22.0	23.0	23.1	25.9	31.1	33.0	32.7
0930	22.0	23.0	23.1	25.9	31.1	33.0	32.7
0945	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1000	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1015	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1030	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1045	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1100	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1115	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1130	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1145	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1200	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1215	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1230	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1245	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1300	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1315	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1330	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1345	22.0	23.0	23.1	25.9	31.1	33.0	32.7
1400	22.0	23.0	23.1	25.9	31.1	33.0	32.7

1415	51.4	45.5	44.5	40.7	33.9	32.5	32.6
1430	50.8	45.5	44.5	41.0	34.1	32.5	32.6
1445	49.6	45.4	44.5	41.2	34.4	32.5	32.6
1500	48.0	45.3	44.4	41.4	34.6	32.6	32.6
1515	47.2	45.1	44.2	41.6	34.9	32.6	32.6
1530	47.1	44.8	44.0	41.7	35.1	32.6	32.6
1545	46.8	44.6	43.8	41.7	35.3	32.6	32.6
1600	46.1	44.3	43.6	41.7	35.5	32.6	32.6
1615	44.8	43.9	43.2	41.7	35.7	32.7	32.6
1630	42.9	43.2	42.8	41.6	35.9	32.7	32.6
1645	40.8	42.3	42.1	41.4	36.0	32.7	32.7
1700	39.5	41.4	41.3	41.2	36.2	32.8	32.6
1715	38.5	40.6	40.6	40.9	36.3	32.8	32.6
1730	37.7	39.9	39.9	40.5	36.5	32.9	32.6
1745	37.1	39.2	39.2	40.2	36.5	32.9	32.6
1800	36.5	38.6	38.7	39.8	36.6	32.9	32.6
1815	36.0	38.0	38.2	39.4	36.6	32.9	32.6
1830	35.4	37.5	37.7	39.0	36.6	33.0	32.7
1845	34.7	37.0	37.2	38.7	36.6	33.1	32.8
1900	33.9	36.5	36.8	38.3	36.6	33.1	32.8
1915	33.2	36.0	36.3	38.0	36.6	33.1	32.8
1930	32.9	35.5	35.6	37.7	36.5	33.2	32.8
1945	31.4	35.1	35.4	37.3	36.5	33.2	32.8
2000	31.3	35.0	35.2	37.0	36.4	33.2	32.7
2015	31.0	34.8	35.0	36.7	36.3	33.3	32.7
2030	32.6	34.6	34.8	36.5	36.3	33.3	32.6
2045	32.3	34.4	34.6	36.3	36.3	33.3	32.6
2100	31.9	34.1	34.3	36.2	36.2	33.4	32.6
2115	31.4	33.7	34.0	36.1	36.2	33.4	32.6
2130	31.0	33.4	33.7	35.8	36.0	33.5	32.6
2145	30.6	33.1	33.3	35.3	35.9	33.5	32.7
2200	30.3	32.7	33.0	35.1	35.8	33.5	32.7
2215	30.0	32.5	32.8	34.9	35.7	33.6	32.8
2230	29.8	32.3	32.5	34.7	35.6	33.6	32.8
2245	29.5	32.1	32.2	34.5	35.5	33.7	32.8
2300	29.2	31.7	32.0	34.2	35.4	33.7	32.8
2315	28.7	31.4	31.7	34.0	35.2	33.7	32.8
2330	28.5	31.2	31.5	33.8	35.2	33.7	32.8
2345	28.3	30.9	31.2	33.6	35.1	33.7	32.8
2400	28.3	30.7	31.0	33.3	35.0	33.7	32.8

02/03/12  
14:53:22

1

12sep90.wbk

THERMISTOR DATA  
WASILUFT PROFILE  
SANDIA ENVIRONMENTAL MEPA  
12 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
h:m:s	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	28.1	30.5	30.8	31.1	34.9	33.7	32.8
0030	30.6	30.1	30.6	32.9	34.9	33.7	32.8
0045	30.6	30.1	30.6	32.9	34.9	33.7	32.8
0100	30.4	29.8	30.3	32.4	34.6	33.8	32.8
0115	30.0	29.6	29.9	32.4	34.6	33.8	32.8
0130	29.8	29.4	29.7	32.2	34.3	33.8	32.8
0145	29.5	29.1	29.3	32.0	34.3	33.8	32.8
0200	29.4	28.9	29.2	31.8	34.2	33.8	32.8
0215	29.1	28.7	28.8	31.6	34.1	33.8	32.8
0230	28.9	28.4	28.6	31.4	34.0	33.7	32.8
0245	28.7	28.2	28.4	31.1	33.8	33.7	32.8
0300	28.5	28.0	28.4	31.1	33.8	33.7	32.8
0315	28.4	27.9	28.2	30.9	33.7	33.6	32.9
0330	28.2	27.7	28.0	30.7	33.5	33.6	32.9
0345	28.0	27.5	27.8	30.5	33.4	33.5	32.9
0400	27.8	27.3	27.6	30.4	33.4	33.5	32.9
0415	27.6	27.1	27.4	30.2	33.3	33.4	32.9
0430	27.4	26.9	27.2	30.1	33.2	33.3	32.9
0445	27.2	26.7	27.0	29.9	33.0	33.2	32.9
0500	27.0	26.5	26.8	29.6	32.8	33.0	32.9
0515	26.8	26.3	26.6	29.3	32.6	32.8	32.9
0530	26.6	26.1	26.4	29.1	32.5	32.7	32.9
0545	26.4	25.9	26.2	28.9	32.4	32.6	32.9
0600	26.2	25.7	26.0	28.7	32.3	32.5	32.9
0615	26.0	25.5	25.8	28.5	32.2	32.4	32.9
0630	25.8	25.3	25.6	28.3	32.1	32.3	32.9
0645	25.6	25.1	25.4	28.1	32.0	32.2	32.9
0700	25.4	24.9	25.2	27.9	31.9	32.1	32.9
0715	25.2	24.7	25.0	27.7	31.8	32.0	32.9
0730	25.0	24.5	24.8	27.5	31.7	31.9	32.9
0745	24.8	24.3	24.6	27.3	31.6	31.8	32.9
0800	24.6	24.1	24.4	27.1	31.5	31.7	32.9
0815	24.4	23.9	24.2	26.9	31.4	31.6	32.9
0830	24.2	23.7	24.0	26.7	31.3	31.5	32.9
0845	24.0	23.5	23.8	26.5	31.2	31.4	32.9
0900	23.8	23.3	23.6	26.3	31.1	31.3	32.9
0915	23.6	23.1	23.4	26.1	31.0	31.2	32.9
0930	23.4	22.9	23.2	25.9	30.9	31.1	32.9
0945	23.2	22.7	23.0	25.7	30.8	31.0	32.9
1000	23.0	22.5	22.8	25.5	30.7	30.9	32.9
1015	22.8	22.3	22.6	25.3	30.6	30.8	32.9
1030	22.6	22.1	22.4	25.1	30.5	30.7	32.9
1045	22.4	21.9	22.2	24.9	30.4	30.6	32.9
1100	22.2	21.7	22.0	24.7	30.3	30.5	32.9
1115	22.0	21.5	21.8	24.5	30.2	30.4	32.9
1130	21.8	21.3	21.6	24.3	30.1	30.3	32.9
1145	21.6	21.1	21.4	24.1	30.0	30.2	32.9
1200	21.4	20.9	21.2	23.9	29.9	30.1	32.9
1215	21.2	20.7	21.0	23.7	29.8	30.0	32.9
1230	21.0	20.5	20.8	23.5	29.7	29.9	32.9
1245	20.8	20.3	20.6	23.3	29.6	29.8	32.9
1300	20.6	20.1	20.4	23.1	29.5	29.7	32.9
1315	20.4	19.9	20.2	22.9	29.4	29.6	32.9
1330	20.2	19.7	20.0	22.7	29.3	29.5	32.9
1345	20.0	19.5	19.8	22.5	29.2	29.4	32.9

1400	55.9	48.2	44.3	38.1	34.2	34.2	31.9
1415	55.4	48.5	44.6	38.5	34.3	34.2	31.9
1430	54.9	48.5	44.8	38.8	34.4	34.1	31.9
1445	54.5	48.4	45.0	39.2	34.5	34.1	31.8
1500	54.5	48.4	45.1	39.5	34.7	34.1	31.8
1515	53.7	48.4	45.2	39.8	34.9	34.1	31.8
1530	53.2	48.3	45.3	40.1	35.0	34.1	31.8
1545	52.4	48.3	45.3	40.3	35.2	34.1	31.8
1600	51.3	47.8	45.3	40.5	35.3	34.1	31.8
1615	51.0	47.6	45.1	40.7	35.3	34.1	31.8
1630	50.7	47.4	45.1	40.8	35.3	34.1	31.8
1645	49.7	46.4	44.9	41.0	35.4	34.1	31.8
1700	47.6	46.0	44.4	41.1	35.4	34.1	31.8
1715	46.5	45.4	44.3	41.1	35.4	34.0	31.9
1730	44.9	44.6	43.9	41.1	35.4	34.0	31.9
1745	43.7	44.0	43.1	41.1	35.4	34.0	31.9
1800	42.3	43.3	42.1	41.1	35.5	34.0	31.9
1815	40.7	42.5	42.4	41.0	35.6	34.0	31.8
1830	39.4	41.7	42.0	40.9	35.7	34.0	31.8
1845	38.2	40.9	41.5	40.8	35.8	34.0	31.9
1900	37.3	40.2	41.0	40.7	37.0	34.0	31.9
1915	36.3	39.5	40.5	40.5	37.0	34.0	31.9
1930	35.7	38.9	40.0	40.2	37.1	34.0	31.9
1945	35.2	38.4	39.6	40.1	37.2	34.1	31.9
2000	34.7	37.9	39.1	39.6	37.3	34.1	31.9
2015	34.2	37.4	38.7	39.4	37.3	34.1	31.9
2030	33.7	37.0	38.3	39.4	37.3	34.1	31.9
2045	33.2	36.5	37.9	39.2	37.4	34.1	31.9
2100	32.7	36.2	37.6	39.0	37.4	34.2	32.4
2115	32.3	35.7	37.2	38.7	37.4	34.1	32.4
2130	31.7	35.3	36.9	38.5	37.4	34.1	32.4
2145	31.3	34.9	36.5	38.3	37.4	34.1	32.4
2200	30.8	34.5	36.2	38.0	37.4	34.1	32.9
2215	30.4	34.2	35.9	37.8	37.4	34.2	32.9
2230	30.0	33.8	35.6	37.6	36.5	34.2	32.9
2245	29.7	33.4	35.2	37.4	36.3	34.2	32.9
2300	29.4	33.1	34.6	37.2	36.3	34.2	32.9
2315	29.2	32.8	34.0	37.0	36.3	34.2	32.9
2330	29.0	32.5	33.3	36.7	35.7	34.2	32.9
2345	29.0	32.3	32.1	36.5	35.7	34.2	32.9
2400	29.0	32.0	31.8	36.3	35.4	34.3	32.9

92/03/12  
145345

1

13sep90.wbk

13 SEP 1990  
THERMISTOR DATA  
WASHBANK PROFILE  
RADARN ENVIRONMENTAL AREA

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	29.1	31.5	31.8	34.1	35.6	36.2	33.0
0030	28.9	31.1	31.5	33.9	35.3	36.2	33.0
0045	28.8	31.1	31.4	33.7	35.4	36.3	33.0
0100	28.5	30.9	31.2	33.6	35.3	36.3	33.1
0115	28.3	30.7	31.0	33.4	35.2	36.3	33.1
0130	28.1	30.5	30.8	33.2	35.1	36.3	33.1
0145	27.9	30.3	30.6	33.0	35.0	36.3	33.1
0200	27.6	30.1	30.4	32.9	34.9	36.3	33.1
0215	27.4	29.9	30.2	32.7	34.8	36.3	33.1
0230	27.2	29.7	30.0	32.5	34.7	36.3	33.1
0245	27.0	29.5	29.8	32.3	34.6	36.3	33.1
0300	26.8	29.3	29.6	32.2	34.5	36.3	33.1
0315	26.6	29.1	29.5	32.0	34.4	36.3	33.1
0330	26.4	28.9	29.3	31.8	34.3	36.3	33.1
0345	26.2	28.7	29.1	31.7	34.2	36.3	33.1
0400	26.4	28.6	28.9	31.5	34.1	36.2	33.1
0415	26.5	28.5	28.8	31.3	34.0	36.2	33.1
0430	26.4	28.5	28.8	31.2	33.9	36.2	33.1
0445	26.2	28.4	28.6	31.1	33.8	36.2	33.1
0500	26.0	28.2	28.5	31.0	33.7	36.2	33.1
0515	25.9	28.1	28.4	30.9	33.6	36.2	33.1
0530	26.1	28.0	28.3	30.8	33.6	36.2	33.2
0545	26.0	28.0	28.3	30.7	33.5	36.2	33.2
0600	25.8	27.9	28.2	30.5	33.4	36.2	33.2
0615	25.7	27.8	28.1	30.4	33.3	36.2	33.2
0630	25.7	27.7	28.0	30.3	33.2	36.2	33.2
0645	25.8	27.6	27.9	30.2	33.1	36.2	33.2
0700	26.2	27.6	27.8	30.1	33.0	36.1	33.2
0715	27.1	27.7	27.9	30.0	32.9	36.1	33.2
0730	28.5	28.0	28.1	30.0	32.8	36.0	33.2
0745	29.8	28.5	28.5	30.0	32.7	36.0	33.2
0800	31.2	29.0	29.0	30.0	32.7	36.0	33.2
0815	32.7	29.7	29.6	30.2	32.6	36.0	33.2
0830	34.1	30.5	30.3	30.4	32.5	36.0	33.2
0845	35.5	31.2	31.0	30.7	32.5	36.0	33.2
0900	37.0	32.1	31.7	31.0	32.5	36.0	33.2
0915	39.3	32.8	32.4	31.3	32.5	36.0	33.2
0930	39.6	33.7	33.2	31.7	32.5	36.0	33.2
0945	41.3	34.6	34.0	32.2	32.5	36.0	33.2
1000	42.8	35.3	34.9	32.7	32.4	36.0	33.2
1015	44.5	36.4	35.7	33.2	32.4	36.0	33.1
1030	46.2	37.4	36.6	33.6	32.3	36.0	33.1
1045	47.5	38.4	37.5	34.3	32.3	36.0	33.1
1100	48.6	39.3	38.4	34.9	32.3	36.0	33.1
1115	49.7	40.2	39.2	35.2	32.3	36.0	33.1
1130	50.8	41.0	40.0	36.2	32.3	36.0	33.1
1145	51.6	41.8	40.8	36.8	32.0	36.0	33.1
1200	52.2	42.6	41.5	37.4	32.2	36.0	33.1
1215	52.8	43.2	42.2	38.0	32.4	36.0	33.1
1230	53.2	43.7	42.7	38.6	32.5	36.0	33.1
1245	53.5	44.3	43.3	39.1	32.7	36.0	33.1
1300	53.8	44.7	43.7	39.7	32.0	36.0	33.1
1315	53.9	45.2	44.1	40.2	36.2	36.0	33.1
1330	53.8	45.5	44.4	40.6	36.5	36.0	33.1
1345	53.6	45.7	44.6	41.0	36.7	36.0	33.1
1400	53.3	45.8	44.8	41.3	36.9	36.0	33.1

1415	53.1	45.9	44.9	41.7	35.1	35.1	33.3
1430	52.4	46.0	45.0	42.0	35.4	35.4	33.3
1445	51.2	46.0	45.1	42.2	35.6	35.6	33.3
1500	49.7	46.0	45.1	42.4	35.8	35.8	33.3
1515	48.7	45.9	45.0	42.6	36.1	36.1	33.3
1530	48.4	45.6	44.8	42.7	36.3	36.3	33.3
1545	47.8	45.4	44.6	42.8	36.5	36.5	33.3
1600	47.0	45.0	44.3	42.8	36.7	36.7	33.3
1615	45.7	44.6	44.0	42.8	36.9	36.9	33.3
1630	43.8	44.0	43.5	42.7	37.0	37.0	33.3
1645	42.0	43.2	42.5	42.5	37.2	37.2	33.3
1700	40.6	42.4	42.2	42.2	37.3	37.3	33.3
1715	39.5	41.6	41.5	42.0	37.4	37.4	33.3
1730	38.8	40.9	40.9	41.6	37.5	37.5	33.3
1745	39.2	40.4	40.4	41.3	37.6	37.6	33.3
1800	37.5	39.5	39.5	41.0	37.7	37.7	33.3
1815	36.9	39.3	39.4	40.4	37.7	37.7	33.3
1830	36.2	38.7	38.9	40.3	37.7	37.7	33.3
1845	35.6	38.2	38.4	40.0	37.7	37.7	33.3
1900	35.1	37.8	37.9	39.6	37.7	37.7	33.3
1915	34.6	37.3	37.5	39.3	37.6	37.6	33.3
1930	34.2	36.9	37.1	39.0	37.6	37.6	33.3
1945	33.8	36.5	36.8	38.7	37.6	37.6	33.3
2000	32.5	36.1	36.4	38.4	37.5	37.5	33.3
2015	32.1	35.8	36.0	38.1	37.5	37.5	33.3
2030	32.0	35.5	35.7	37.8	37.5	37.5	33.3
2045	32.4	35.1	35.4	37.5	37.5	37.5	33.3
2100	32.1	34.8	35.0	37.2	37.4	37.4	33.3
2115	31.8	34.5	34.8	37.0	37.1	37.1	33.3
2130	31.5	34.3	34.5	36.9	37.1	37.1	33.3
2145	31.2	34.0	34.2	36.5	37.0	37.0	33.3
2200	30.5	33.7	34.0	36.3	36.9	36.9	33.3
2215	30.2	33.4	33.7	36.0	36.8	36.8	33.3
2230	29.5	33.1	33.4	35.9	36.7	36.7	33.3
2245	29.8	32.9	33.1	35.6	36.5	36.5	33.3
2300	29.4	32.5	32.8	35.3	36.5	36.5	33.3
2315	29.6	32.3	32.6	35.1	36.3	36.3	33.3
2330	29.4	32.1	32.4	34.9	36.2	36.2	33.3
2345	29.2	31.9	32.2	34.7	36.1	36.1	33.3
2400	29.1	31.8	32.0	34.5	36.1	36.1	33.3

9/20/92  
14:53:44

1

14sep90.wbk

TEHRISTOR DATA  
WATERMUR PROFILE  
SADAN ENVIRONMENTAL AREA  
18 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hr:min	deg C	deg C	deg C	deg C	deg C	deg C	deg C
0015	28.9	31.5	31.4	34.4	36.0	34.7	33.3
0030	28.5	31.1	31.4	34.2	35.8	34.7	33.3
0045	28.5	31.1	31.4	34.0	35.7	34.7	33.3
0100	28.2	30.9	31.2	33.8	35.6	34.7	33.3
0115	28.0	30.7	31.0	33.6	35.5	34.7	33.3
0130	27.8	30.5	30.8	33.4	35.4	34.7	33.3
0145	27.5	30.3	30.6	33.2	35.3	34.7	33.3
0200	27.3	30.1	30.4	33.1	35.2	34.7	33.3
0215	27.1	29.9	30.2	32.9	35.1	34.7	33.3
0230	26.9	29.7	30.0	32.7	35.0	34.7	33.3
0245	26.6	29.5	29.8	32.5	34.9	34.7	33.3
0300	26.4	29.4	29.7	32.4	34.8	34.7	33.3
0315	26.2	29.3	29.6	32.3	34.7	34.7	33.3
0330	26.0	29.2	29.5	32.2	34.6	34.7	33.3
0345	25.8	29.1	29.4	32.1	34.5	34.6	33.3
0400	25.6	29.0	29.3	32.0	34.4	34.6	33.3
0415	25.4	28.9	29.2	31.9	34.3	34.6	33.3
0430	25.2	28.8	29.1	31.8	34.2	34.6	33.3
0445	25.0	28.7	29.0	31.7	34.1	34.6	33.3
0500	24.8	28.6	28.9	31.6	34.0	34.6	33.3
0515	24.6	28.5	28.8	31.5	33.9	34.6	33.3
0530	24.4	28.4	28.7	31.4	33.8	34.6	33.3
0545	24.2	28.3	28.6	31.3	33.7	34.6	33.3
0600	24.0	28.2	28.5	31.2	33.6	34.6	33.3
0615	23.8	28.1	28.4	31.1	33.5	34.6	33.3
0630	23.6	28.0	28.3	31.0	33.4	34.6	33.3
0645	23.4	27.9	28.2	30.9	33.3	34.6	33.3
0700	23.2	27.8	28.1	30.8	33.2	34.6	33.3
0715	23.0	27.7	28.0	30.7	33.1	34.6	33.3
0730	22.8	27.6	27.9	30.6	33.0	34.6	33.3
0745	22.6	27.5	27.8	30.5	32.9	34.6	33.3
0800	22.4	27.4	27.7	30.4	32.8	34.6	33.3
0815	22.2	27.3	27.6	30.3	32.7	34.6	33.3
0830	22.0	27.2	27.5	30.2	32.6	34.6	33.3
0845	21.8	27.1	27.4	30.1	32.5	34.6	33.3
0900	21.6	27.0	27.3	30.0	32.4	34.6	33.3
0915	21.4	26.9	27.2	29.9	32.3	34.6	33.3
0930	21.2	26.8	27.1	29.8	32.2	34.6	33.3
0945	21.0	26.7	27.0	29.7	32.1	34.6	33.3
1000	20.8	26.6	26.9	29.6	32.0	34.6	33.3
1015	20.6	26.5	26.8	29.5	31.9	34.6	33.3
1030	20.4	26.4	26.7	29.4	31.8	34.6	33.3
1045	20.2	26.3	26.6	29.3	31.7	34.6	33.3
1100	20.0	26.2	26.5	29.2	31.6	34.6	33.3
1115	19.8	26.1	26.4	29.1	31.5	34.6	33.3
1130	19.6	26.0	26.3	29.0	31.4	34.6	33.3
1145	19.4	25.9	26.2	28.9	31.3	34.6	33.3
1200	19.2	25.8	26.1	28.8	31.2	34.6	33.3
1215	19.0	25.7	26.0	28.7	31.1	34.6	33.3
1230	18.8	25.6	25.9	28.6	31.0	34.6	33.3
1245	18.6	25.5	25.8	28.5	30.9	34.6	33.3
1300	18.4	25.4	25.7	28.4	30.8	34.6	33.3
1315	18.2	25.3	25.6	28.3	30.7	34.6	33.3
1330	18.0	25.2	25.5	28.2	30.6	34.6	33.3
1345	17.8	25.1	25.4	28.1	30.5	34.6	33.3
1400	17.6	25.0	25.3	28.0	30.4	34.6	33.3

1415	31.2	46.0	45.0	43.2	35.7	34.0	33.6
1430	50.2	45.9	45.0	42.3	35.9	34.0	33.5
1445	50.9	45.8	45.0	42.4	36.1	34.0	33.5
1500	49.4	45.7	44.9	42.4	36.2	34.0	33.5
1515	48.5	45.7	44.9	42.4	36.2	34.0	33.5
1530	47.0	45.5	44.7	42.4	36.2	34.0	33.5
1545	47.7	45.2	44.5	42.4	36.2	34.0	33.5
1600	46.8	44.9	44.2	42.4	36.2	34.0	33.5
1615	45.8	44.5	43.8	42.4	36.2	34.0	33.5
1630	45.2	44.5	43.8	42.4	36.2	34.0	33.5
1645	44.6	44.5	43.8	42.4	36.2	34.0	33.5
1700	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1715	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1730	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1745	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1800	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1815	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1830	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1845	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1900	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1915	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1930	44.4	44.5	43.8	42.4	36.2	34.0	33.5
1945	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2000	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2015	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2030	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2045	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2100	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2115	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2130	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2145	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2200	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2215	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2230	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2245	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2300	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2315	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2330	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2345	44.4	44.5	43.8	42.4	36.2	34.0	33.5
2400	44.4	44.5	43.8	42.4	36.2	34.0	33.5

1

15sep90.wbk

92/03/12  
14:54:01

TEMPERATURE DATA  
WASHBURN PROFILE  
SANDHORN ENVIRONMENTAL AREA  
15 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
from	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	28.6	31.6	31.9	34.5	36.2	35.1	33.6
0030	28.4	31.4	31.7	34.3	36.0	35.1	33.6
0045	28.2	31.1	31.5	34.1	35.9	35.1	33.6
0100	28.0	31.0	31.3	33.9	35.8	35.1	33.6
0115	28.0	30.8	31.1	33.6	35.7	35.1	33.6
0130	27.9	30.6	30.9	33.4	35.6	35.1	33.6
0140	28.0	30.5	30.8	33.4	35.5	35.1	33.6
0200	28.4	30.4	30.7	33.2	35.4	35.1	33.6
0215	28.4	30.4	30.6	33.1	35.3	35.1	33.6
0230	28.2	30.3	30.6	33.0	35.2	35.1	33.6
0245	27.9	30.2	30.5	32.9	35.1	35.0	33.6
0300	27.6	30.1	30.3	32.8	35.0	35.0	33.6
0315	27.4	29.9	30.2	32.6	34.9	35.0	33.6
0330	27.3	29.8	30.0	32.5	34.8	35.0	33.6
0345	27.1	29.6	29.9	32.4	34.7	35.0	33.6
0400	27.0	29.4	29.7	32.2	34.6	35.0	33.6
0415	26.9	29.4	29.6	32.2	34.6	35.0	33.7
0430	26.8	29.2	29.5	32.1	34.5	35.0	33.7
0445	26.6	29.1	29.4	31.9	34.4	35.0	33.7
0515	26.6	28.9	29.1	31.7	34.2	34.9	33.7
0530	26.7	28.8	29.0	31.6	34.1	34.9	33.7
0545	26.8	28.7	28.9	31.5	34.0	34.9	33.7
0600	26.8	28.7	28.9	31.4	33.9	34.9	33.7
0615	26.8	28.6	28.9	31.3	33.8	34.8	33.7
0630	26.8	28.6	28.9	31.2	33.8	34.8	33.7
0645	26.7	28.5	28.8	31.1	33.7	34.8	33.7
0700	26.8	28.5	28.8	31.0	33.6	34.8	33.7
0715	27.1	28.5	28.7	31.0	33.5	34.8	33.7
0730	27.6	28.5	28.7	30.9	33.5	34.8	33.7
0745	28.4	28.6	28.8	30.8	33.4	34.7	33.7
0800	28.5	28.6	28.8	30.8	33.3	34.7	33.7
0815	28.5	29.0	29.0	30.8	33.2	34.7	33.7
0830	28.9	29.1	29.1	30.9	33.2	34.7	33.7
0845	32.0	29.3	29.3	30.9	33.1	34.6	33.7
0900	36.4	30.1	30.0	30.9	33.0	34.6	33.7
0915	33.8	31.1	30.9	31.1	32.9	34.6	33.7
0930	33.7	31.3	31.1	31.4	32.9	34.5	33.7
0945	34.0	31.5	31.3	31.4	32.9	34.5	33.7
1000	34.3	31.8	31.6	31.8	32.9	34.5	33.7
1015	35.3	32.1	31.8	32.0	32.9	34.5	33.7
1030	36.1	32.5	32.2	32.2	32.9	34.5	33.7
1045	37.1	32.9	32.5	32.4	32.9	34.4	33.7
1100	37.2	33.3	33.0	32.6	32.9	34.4	33.7
1115	38.9	33.8	33.3	32.9	32.9	34.4	33.7
1130	38.3	34.2	33.7	33.1	32.9	34.3	33.7
1145	37.3	34.4	34.0	33.3	32.9	34.3	33.7
1200	36.7	34.4	34.0	33.3	32.9	34.3	33.7
1215	36.3	34.4	34.0	33.3	32.9	34.3	33.7
1230	35.8	34.3	34.0	33.3	32.9	34.3	33.7
1245	35.3	34.2	34.0	33.3	32.9	34.3	33.7
1300	34.8	34.1	33.9	33.2	32.9	34.3	33.7
1315	34.4	33.9	33.8	33.1	32.9	34.3	33.7
1330	34.4	33.8	33.8	33.1	32.9	34.3	33.7
1345	34.5	33.8	33.8	33.1	32.9	34.3	33.7
1400	34.7	33.8	33.8	33.1	32.9	34.3	33.7

1415	40.7	34.6	34.2	34.2	34.2	34.2	33.7
1430	39.6	35.4	34.1	34.1	34.1	34.2	34.2
1445	38.0	35.7	35.2	35.2	35.2	34.2	33.7
1500	37.2	35.6	34.8	34.8	34.8	34.1	33.8
1515	36.9	35.5	34.9	34.9	34.9	34.1	33.8
1530	36.9	35.5	35.2	35.2	35.2	34.1	33.8
1545	39.3	35.5	35.2	35.2	35.2	34.1	33.8
1600	41.8	35.2	35.2	35.2	35.2	34.1	33.8
1615	41.1	36.9	36.2	36.2	36.2	34.1	33.8
1630	38.5	37.0	36.4	36.4	36.4	34.0	33.7
1645	36.6	36.4	36.2	36.2	36.2	34.0	33.7
1700	35.4	36.1	35.9	35.8	35.8	34.0	33.7
1715	34.4	35.6	35.5	35.5	35.5	34.0	33.7
1730	33.8	35.1	35.1	35.1	35.1	34.0	33.7
1745	33.0	34.7	34.7	34.7	34.7	34.0	33.7
1800	33.0	34.4	34.4	34.4	34.4	34.0	33.7
1815	32.5	34.1	34.2	34.2	34.2	34.1	33.8
1830	32.1	33.8	33.9	33.9	33.9	34.1	33.8
1845	31.6	33.5	33.4	33.4	33.4	34.0	33.7
1900	31.1	33.2	33.3	33.3	33.3	34.0	33.7
1915	30.8	32.9	32.7	32.7	32.7	34.0	33.7
1930	30.5	32.6	32.7	32.7	32.7	34.0	33.7
1945	30.2	32.3	32.5	32.5	32.5	34.0	33.7
2000	29.9	32.1	32.2	32.2	32.2	34.0	33.7
2015	29.7	31.8	32.0	32.0	32.0	34.0	33.7
2030	29.5	31.6	31.8	31.8	31.8	34.0	33.7
2045	29.4	31.4	31.6	31.6	31.6	34.0	33.7
2100	29.4	31.2	31.4	31.4	31.4	34.0	33.7
2115	29.3	31.1	31.3	31.3	31.3	34.0	33.7
2130	29.2	31.0	31.1	31.1	31.1	34.0	33.7
2145	29.0	30.9	31.0	31.0	31.0	34.1	33.7
2200	28.7	30.7	30.9	30.9	30.9	34.1	33.7
2215	28.5	30.5	30.7	30.7	30.7	34.1	33.7
2230	28.4	30.4	30.6	30.6	30.6	34.1	33.7
2245	28.3	30.2	30.4	30.4	30.4	34.1	33.7
2300	28.2	30.1	30.3	30.3	30.3	34.1	33.7
2315	28.1	30.0	30.2	30.2	30.2	34.1	33.7
2330	28.0	29.9	30.1	30.1	30.1	34.0	33.7
2345	27.9	29.7	29.9	29.9	29.9	34.0	33.7
2400	27.7	29.6	29.8	29.8	29.8	34.0	33.7

92/03/12  
14:50:53

1  
THERMISTOR DATA  
WATERBURY PROFILE  
SADMAN ENVIRONMENTAL AREA  
18 SEP 1990

	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
	deg C	deg C	deg C	deg C	deg C	deg C	deg C
0015	21.5	20.5	20.7	21.6	21.4	21.0	21.7
0030	21.2	20.4	20.4	21.3	21.3	21.0	21.7
0045	21.0	20.2	20.4	21.3	21.3	21.0	21.7
0100	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0115	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0130	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0145	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0200	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0215	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0230	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0245	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0300	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0315	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0330	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0345	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0400	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0415	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0430	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0445	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0500	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0515	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0530	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0545	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0600	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0615	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0630	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0645	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0700	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0715	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0730	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0745	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0800	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0815	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0830	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0845	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0900	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0915	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0930	20.7	20.0	20.1	21.3	21.2	21.0	21.7
0945	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1000	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1015	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1030	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1045	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1100	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1115	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1130	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1145	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1200	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1215	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1230	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1245	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1300	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1315	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1330	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1345	20.7	20.0	20.1	21.3	21.2	21.0	21.7
1400	20.7	20.0	20.1	21.3	21.2	21.0	21.7

16sep90.wbk

1415	52.5	44.4	43.5	40.5	34.0	33.1	33.5
1430	52.1	44.5	43.5	40.5	34.0	33.1	33.5
1445	50.6	44.6	43.7	41.1	34.5	33.2	33.6
1500	48.6	44.5	43.7	41.3	34.8	33.2	33.6
1515	48.0	44.5	43.7	41.4	35.0	33.2	33.6
1530	47.6	44.5	43.7	41.5	35.2	33.2	33.6
1545	47.1	44.5	43.7	41.5	35.4	33.1	33.5
1600	46.3	43.8	43.1	41.7	35.6	33.1	33.5
1615	44.8	43.4	42.8	41.6	35.6	33.3	33.5
1630	42.2	42.8	42.2	41.6	36.0	33.3	33.5
1645	40.8	42.0	41.2	41.4	36.1	33.3	33.5
1700	39.9	41.1	40.2	41.2	36.2	33.2	33.5
1715	39.7	40.3	39.6	40.2	36.4	33.2	33.5
1730	39.9	39.6	39.6	40.5	36.5	33.4	33.5
1745	39.3	38.4	39.0	40.2	36.5	33.4	33.5
1800	38.6	37.9	38.5	39.6	36.6	33.5	33.5
1815	38.4	37.9	38.5	39.6	36.6	33.5	33.5
1830	38.4	37.9	38.5	39.6	36.6	33.5	33.5
1845	38.4	37.9	38.5	39.6	36.6	33.5	33.5
1900	38.4	37.9	38.5	39.6	36.6	33.5	33.5
1915	38.4	37.9	38.5	39.6	36.6	33.5	33.5
1930	38.4	37.9	38.5	39.6	36.6	33.5	33.5
1945	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2000	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2015	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2030	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2045	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2100	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2115	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2130	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2145	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2200	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2215	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2230	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2245	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2300	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2315	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2330	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2345	38.4	37.9	38.5	39.6	36.6	33.5	33.5
2400	38.4	37.9	38.5	39.6	36.6	33.5	33.5

92/03/12  
14:51:14

17sep90.wbk

1  
THERMISTOR DATA  
WASHBURN PROFILE  
RADON ENVIRONMENTAL AREA  
17 SEP 1990

TIME HMS	0.0cm deg C	-2.5cm deg C	-5.0cm deg C	-10.0cm deg C	-20.0cm deg C	-40.0cm deg C	-70.0cm deg C
0015	27.2	30.5	30.8	31.5	35.0	34.2	33.5
0030	27.0	30.1	30.6	31.3	34.9	34.2	33.5
0045	26.9	30.1	30.4	31.1	34.8	34.2	33.5
0100	26.9	29.9	30.2	32.5	34.7	34.2	33.5
0115	26.5	29.8	30.1	31.8	34.6	34.2	33.5
0130	26.7	29.4	40.0	32.8	34.5	34.2	33.4
0145	26.7	29.5	29.9	32.5	34.4	34.2	33.5
0200	26.6	29.4	29.7	32.4	34.3	34.2	33.5
0215	26.5	29.3	29.6	32.2	34.2	34.2	33.5
0230	26.4	29.2	29.5	32.1	34.1	34.2	33.5
0245	26.3	29.0	29.4	31.9	34.0	34.2	33.5
0300	26.2	28.9	29.2	31.9	33.9	34.2	33.5
0315	26.2	28.8	29.1	31.7	33.8	34.2	33.5
0330	26.1	28.7	29.0	31.6	33.7	34.2	33.5
0345	26.1	28.6	28.9	31.4	33.7	34.2	33.5
0400	26.3	28.5	28.8	31.3	33.6	34.2	33.5
0415	26.4	28.5	28.8	31.2	33.5	34.2	33.5
0430	26.5	28.5	28.7	31.1	33.4	34.2	33.5
0445	26.6	28.4	28.7	31.0	33.3	34.2	33.5
0515	26.4	28.4	28.6	30.9	33.2	34.2	33.5
0530	26.4	28.3	28.6	30.8	33.0	34.2	33.5
0545	26.1	28.2	28.5	30.8	33.0	34.1	33.5
0600	26.1	28.2	28.5	30.7	32.9	34.1	33.5
0615	25.9	28.1	28.4	30.6	32.8	34.1	33.5
0630	25.7	28.0	28.2	30.4	32.8	34.1	33.5
0645	25.6	27.9	28.1	30.5	32.7	34.0	33.5
0700	26.4	27.8	28.0	30.4	32.6	34.0	33.5
0715	26.6	27.9	28.1	30.3	32.6	34.0	33.5
0730	27.3	28.0	28.2	30.2	32.5	34.0	33.5
0745	28.4	28.2	28.3	30.2	32.4	34.0	33.5
0800	28.2	28.4	28.5	30.2	32.4	34.0	33.5
0815	28.6	28.6	28.7	30.3	32.3	34.0	33.5
0830	29.1	28.8	28.8	30.3	32.3	34.0	33.5
0845	30.3	29.0	29.0	30.4	32.2	33.9	33.5
0900	31.6	29.4	29.4	30.5	32.2	33.9	33.5
0915	35.7	30.0	29.9	30.7	32.2	33.9	33.5
0930	36.7	31.1	30.7	31.0	32.0	33.8	33.5
0945	35.3	31.7	31.4	31.4	32.0	33.8	33.5
1000	35.8	32.0	31.7	31.6	32.0	33.7	33.5
1015	36.7	32.3	32.0	31.6	32.0	33.7	33.5
1030	36.9	32.6	31.1	30.0	32.0	33.2	32.8
1045	42.3	33.7	31.6	30.2	31.9	33.2	32.8
1100	46.9	36.2	32.7	30.4	31.9	33.2	32.8
1115	48.1	38.3	34.0	30.6	31.8	33.2	32.8
1130	48.8	39.6	35.2	30.9	31.8	33.2	32.8
1145	48.7	40.6	34.3	31.3	31.8	33.2	32.8
1200	49.3	41.4	37.2	31.8	31.8	33.1	32.8
1215	50.7	42.1	38.0	32.3	31.8	33.1	32.8
1230	50.2	42.9	38.7	32.7	31.9	33.1	32.8
1245	45.3	42.5	39.2	33.2	31.9	33.1	32.8
1300	48.5	41.9	39.2	33.6	32.0	33.1	32.8
1315	50.6	42.6	39.3	34.0	32.0	33.1	32.8
1330	52.3	43.8	39.9	34.3	32.0	33.1	32.8
1345	53.3	44.7	40.6	34.7	32.2	33.1	32.8
1400	54.1	45.5	41.3	35.0	32.2	33.1	32.8

1415	54.2	46.1	41.8	35.4	32.3	33.0	32.9
1430	52.5	46.3	42.3	35.8	32.4	33.0	32.9
1445	50.1	45.8	42.6	36.2	32.5	33.0	32.9
1500	48.7	45.3	42.5	36.5	32.6	33.0	32.9
1515	51.0	45.2	42.4	36.8	32.8	33.0	32.9
1530	50.0	45.2	42.5	37.1	32.9	33.0	32.9
1545	50.0	45.4	42.5	37.3	33.0	33.0	32.9
1600	48.9	45.0	42.5	37.4	33.0	33.0	32.9
1615	48.8	45.0	42.6	37.8	33.2	33.0	32.9
1630	48.9	44.7	42.5	37.9	33.4	33.0	32.9
1645	48.7	44.2	42.5	38.0	33.5	33.0	32.9
1700	48.3	43.4	42.1	38.1	33.7	33.0	32.9
1715	48.8	42.7	41.8	38.3	33.8	33.0	32.9
1730	48.2	42.0	41.4	38.3	34.0	33.0	32.9
1745	39.1	41.0	40.9	38.3	34.1	33.0	32.9
1800	38.3	40.3	40.3	38.3	34.2	33.0	32.9
1815	38.8	39.3	39.5	38.2	34.3	33.0	32.9
1830	35.4	37.7	38.7	38.1	34.4	33.0	32.9
1845	34.5	37.4	38.7	38.0	34.5	33.0	32.9
1900	32.9	36.9	38.1	37.9	34.6	33.0	32.9
1915	32.3	36.3	37.6	37.7	34.7	33.0	32.9
1930	32.3	35.7	37.2	37.5	34.8	33.0	32.9
1945	31.8	35.2	36.7	37.3	34.9	33.0	32.9
2000	31.3	34.7	36.2	37.1	34.9	33.0	32.9
2015	30.7	34.2	35.8	36.9	35.0	33.0	32.9
2030	30.3	33.8	35.4	36.4	35.0	33.0	32.9
2045	30.1	33.4	35.1	36.3	35.1	33.0	32.9
2100	29.8	33.1	34.9	36.3	35.1	33.0	32.9
2115	29.6	32.8	34.4	36.0	35.1	33.0	32.9
2130	29.2	32.5	34.1	35.8	35.1	33.0	32.9
2145	28.8	32.1	33.8	35.6	35.1	33.0	32.9
2200	28.3	31.8	33.5	35.4	35.1	33.0	32.9
2215	28.0	31.5	33.3	35.3	35.1	33.0	32.9
2230	27.4	31.1	33.0	35.0	35.1	33.0	32.9
2245	27.0	30.7	32.7	34.8	35.0	33.0	32.9
2300	26.7	30.4	32.3	34.6	35.0	33.0	32.9
2315	26.4	30.1	32.0	34.4	35.0	33.0	32.9
2330	26.1	29.8	31.8	34.2	34.9	33.0	32.9
2345	25.8	29.5	31.5	34.0	34.8	33.0	32.9
2400	25.5	29.2	31.2	33.8	34.8	33.0	32.9



1

18sep90.wbk

92/03/12  
14:51:32

TECHNISTOR DATA  
WASIGAIR PROFILE  
SHADON ENVIRONMENTAL AREA  
18 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
Hum	deg c	deg c	deg c	deg c	deg c	deg c	deg c
1815	31.5	36.2	36.3	38.6	38.6	33.6	33.5
1830	30.8	35.7	36.0	38.2	38.6	33.7	33.5
1845	30.0	35.1	35.5	37.5	38.6	33.7	33.5
1900	29.4	34.6	34.9	37.5	38.3	33.7	33.5
1915	28.8	34.0	34.6	37.1	38.3	33.8	33.5
1930	28.1	33.5	33.9	36.7	38.2	33.8	33.5
1945	27.5	33.0	33.5	36.4	38.1	33.8	33.5
2000	27.0	32.5	33.0	36.0	38.1	33.9	33.5
2015	26.5	32.1	32.6	35.7	38.0	34.0	33.5
2030	26.0	31.6	32.1	35.3	38.0	34.0	33.5
2045	25.5	31.2	31.7	35.0	38.0	34.0	33.5
2100	25.2	30.8	31.3	34.6	38.0	34.0	33.5
2115	24.8	30.4	31.0	34.4	38.0	34.0	33.5
2130	24.5	30.0	30.6	34.0	38.0	34.1	33.5
2145	24.4	29.7	30.3	33.7	38.0	34.1	33.5
2200	24.1	29.4	29.9	33.4	38.0	34.1	33.5
2215	24.0	29.1	29.6	33.2	38.0	34.1	33.5
2230	23.8	28.8	29.4	32.9	38.0	34.1	33.5
2245	23.6	28.6	29.1	32.6	38.0	34.1	33.5
2300	23.3	28.3	28.9	32.4	38.0	34.1	33.5
2315	22.9	28.0	28.6	32.1	38.0	34.1	33.5
2330	22.7	27.8	28.3	31.9	38.0	34.1	33.5
2345	22.5	27.5	28.1	31.7	38.0	34.2	33.5
2400	22.3	27.3	27.9	31.5	38.0	34.2	33.5

REMARKS: Data Missing Due to Tape Read Error

92/03/12  
14:51:49

1

19sep90.wbk

THEMISTOR DATA  
WASHBANK PROFILE  
SADARN ENVIRONMENTAL AREA  
19 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	22.1	27.0	27.4	31.2	34.0	34.2	33.5
0030	20.9	26.8	27.4	31.0	33.9	34.2	33.5
0045	21.4	26.4	27.2	30.8	33.6	34.2	33.5
0100	21.3	26.3	26.9	30.5	33.6	34.2	33.5
0115	21.0	26.1	26.7	30.3	33.5	34.2	33.5
0130	20.9	25.9	26.4	30.1	33.4	34.1	33.5
0145	20.7	25.6	26.2	29.9	33.2	34.1	33.5
0200	20.4	25.4	26.0	29.7	33.1	34.1	33.5
0215	20.2	25.2	25.8	29.5	33.0	34.1	33.5
0230	20.2	25.1	25.6	29.4	32.9	34.1	33.5
0245	20.0	24.9	25.5	29.2	32.8	34.1	33.5
0300	19.9	24.7	25.3	29.0	32.6	34.1	33.5
0315	19.8	24.5	25.1	28.8	32.5	34.1	33.5
0330	19.5	24.3	24.9	28.6	32.4	34.0	33.5
0345	19.4	24.1	24.7	28.5	32.3	34.0	33.5
0400	19.2	24.0	24.5	28.3	32.1	34.0	33.5
0415	19.1	23.8	24.4	28.1	32.0	34.0	33.5
0430	19.0	23.6	24.2	27.9	31.9	34.0	33.5
0445	18.9	23.5	24.0	27.8	31.8	33.9	33.5
0500	18.8	23.3	23.8	27.6	31.7	33.8	33.5
0515	18.7	23.2	23.6	27.5	31.5	33.6	33.5
0530	18.7	23.0	23.4	27.3	31.4	33.6	33.5
0545	18.6	22.9	23.3	27.2	31.3	33.6	33.5
0600	18.5	22.8	23.1	27.0	31.2	33.7	33.5
0615	18.4	22.7	23.2	26.9	31.1	33.7	33.5
0630	18.4	22.5	23.1	26.7	31.0	33.7	33.5
0645	18.4	22.5	23.0	26.6	30.9	33.6	33.5
0700	18.4	22.5	23.0	26.5	30.8	33.6	33.5
0715	21.2	22.6	23.3	26.3	30.6	33.6	33.5
0730	23.4	22.9	23.3	26.3	30.6	33.6	33.5
0745	25.6	23.5	23.8	26.3	30.5	33.6	33.5
0800	27.9	24.2	24.4	26.4	30.4	33.5	33.5
0815	30.1	24.9	25.0	26.5	30.3	33.5	33.5
0830	32.6	25.8	25.8	26.7	30.2	33.5	33.5
0845	34.6	26.8	26.7	27.0	30.1	33.5	33.5
0900	36.3	27.8	27.6	27.4	30.1	33.4	33.5
0915	38.2	28.7	28.4	27.8	30.0	33.4	33.5
0930	40.5	29.7	29.3	28.3	30.0	33.3	33.5
0945	42.7	30.6	30.2	28.8	30.0	33.3	33.5
1000	44.6	31.7	31.2	29.4	30.0	33.3	33.5
1015	46.2	32.7	32.1	29.9	30.0	33.2	33.5
1030	47.2	33.7	33.1	30.5	30.0	33.2	33.5
1045	48.6	34.7	34.0	31.2	30.1	33.2	33.5
1100	49.5	35.6	34.8	31.6	30.2	33.1	33.5
1115	50.3	36.4	35.6	32.5	30.3	33.1	33.5
1130	51.2	37.2	36.3	33.1	30.5	33.1	33.5
1145	51.8	37.9	37.0	33.7	30.6	33.0	33.5
1200	52.3	38.5	37.7	34.3	30.8	33.0	33.5
1215	52.9	39.2	38.3	34.9	30.9	33.0	33.5
1230	53.5	39.8	38.9	35.5	31.1	32.9	33.5
1245	53.5	40.4	39.5	36.0	31.4	32.9	33.5
1300	53.6	40.9	39.9	36.6	31.6	32.9	33.5
1315	53.2	41.2	40.3	37.0	31.8	32.9	33.5
1330	53.2	41.5	40.6	37.4	32.0	32.9	33.5
1345	53.3	41.8	40.9	37.9	32.2	32.8	33.5
1400	53.1	42.1	41.2	38.2	32.5	32.8	33.5

1415	52.2	42.4	41.5	38.6	32.7	32.8	33.5
1430	51.6	42.5	41.6	38.9	32.9	32.8	33.5
1445	48.1	42.5	41.7	39.2	33.2	32.6	33.5
1500	49.4	42.5	41.5	39.4	33.4	32.6	33.5
1515	49.4	42.2	41.5	39.5	33.6	32.6	33.5
1530	48.5	42.2	41.5	39.6	33.8	32.8	33.5
1545	46.3	42.2	41.4	39.7	34.0	32.9	33.5
1600	44.9	42.9	41.2	39.8	34.2	32.9	33.5
1615	42.7	41.6	41.0	39.8	34.4	32.9	33.4
1630	39.7	41.0	40.5	39.8	34.6	32.9	33.4
1645	37.8	40.3	39.9	39.7	34.7	32.9	33.4
1700	36.3	39.5	39.2	39.5	34.9	32.9	33.4
1715	35.1	38.7	38.6	39.2	35.0	32.9	33.4
1730	34.2	37.9	37.9	38.9	35.1	32.9	33.4
1745	33.4	37.2	37.1	38.6	35.2	33.0	33.4
1800	32.6	36.6	36.6	38.2	35.3	33.0	33.4
1815	31.9	36.1	36.3	38.0	35.3	33.1	33.4
1830	31.1	35.5	35.7	37.6	35.4	33.1	33.4
1845	30.4	35.0	35.2	37.3	35.4	33.1	33.4
1900	29.6	34.4	34.7	36.9	35.3	33.1	33.4
1915	28.9	33.9	34.2	36.6	35.3	33.2	33.3
1930	28.4	33.4	33.7	36.2	35.3	33.2	33.3
1945	27.8	32.9	33.3	35.9	35.2	33.2	33.4
2000	27.3	32.5	32.9	35.6	35.2	33.2	33.4
2015	26.9	32.0	32.5	35.3	35.2	33.3	33.3
2030	26.4	31.6	32.1	34.9	35.1	33.3	33.3
2045	25.8	31.2	31.7	34.6	35.0	33.3	33.3
2100	25.3	30.8	31.2	34.3	34.9	33.3	33.3
2115	24.9	30.4	30.9	34.0	34.8	33.3	33.3
2130	24.5	30.0	30.5	33.7	34.7	33.3	33.3
2145	24.1	29.6	30.1	33.4	34.6	33.3	33.3
2200	23.7	29.2	29.8	33.1	34.5	33.3	33.3
2215	23.5	28.9	29.5	32.8	34.4	33.3	33.3
2230	23.4	28.6	29.1	32.5	34.2	33.3	33.3
2245	23.3	28.3	28.9	32.3	34.1	33.3	33.3
2300	23.3	28.1	28.7	32.0	34.0	33.3	33.3
2315	23.2	28.0	28.5	31.8	33.9	33.3	33.3
2330	23.1	27.8	28.3	31.6	33.8	33.3	33.3
2345	23.1	27.5	28.1	31.4	33.7	33.3	33.3
2400	23.3	27.4	27.9	31.2	33.6	33.3	33.3

92/03/12  
14:52:08

TERMINATOR DATA  
WASHINGTON PROFILE  
SAHON ENVIRONMENTAL MEAS  
20 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	23.0	27.3	27.8	31.0	33.4	33.6	33.3
0030	22.7	27.1	27.6	30.8	33.3	33.6	33.3
0045	22.5	26.7	27.4	30.4	33.2	33.6	33.3
0060	22.3	26.7	27.4	30.4	33.1	33.6	33.3
0075	22.1	26.5	27.2	30.3	33.1	33.6	33.3
0090	21.9	26.4	27.0	30.3	33.0	33.6	33.3
0105	21.7	26.4	26.9	30.1	32.8	33.6	33.3
0120	21.5	26.1	26.7	29.9	32.7	33.5	33.3
0135	21.3	26.0	26.5	29.8	32.6	33.5	33.3
0150	21.4	25.8	26.3	29.6	32.5	33.5	33.3
0165	21.2	25.6	26.1	29.4	32.4	33.5	33.3
0180	21.0	25.5	26.0	29.2	32.3	33.5	33.3
0195	20.9	25.3	25.8	29.1	32.2	33.5	33.3
0210	20.7	25.2	25.7	28.9	32.1	33.5	33.3
0225	20.5	25.0	25.5	28.9	32.0	33.5	33.3
0240	20.3	24.9	25.4	28.7	31.9	33.5	33.3
0255	20.6	24.7	25.2	28.5	31.8	33.5	33.3
0310	20.5	24.6	25.1	28.4	31.7	33.5	33.3
0325	20.5	24.5	25.0	28.3	31.6	33.5	33.3
0340	20.6	24.5	25.0	28.3	31.6	33.5	33.3
0355	19.9	24.1	24.7	28.0	31.3	33.4	33.3
0410	19.8	24.0	24.5	27.8	31.3	33.4	33.3
0425	19.6	23.9	24.4	27.7	31.2	33.3	33.3
0440	19.7	23.9	24.4	27.6	31.2	33.3	33.3
0455	19.6	23.6	24.1	27.5	31.0	33.3	33.3
0510	19.7	23.5	24.0	27.3	30.9	33.3	33.3
0525	19.8	23.5	24.0	27.2	30.8	33.3	33.3
0540	19.8	23.4	23.9	27.1	30.7	33.2	33.3
0555	20.4	23.4	23.8	26.9	30.5	33.2	33.3
0610	21.4	23.4	23.8	26.9	30.5	33.2	33.3
0625	22.1	23.6	24.0	26.8	30.4	33.1	33.3
0640	22.9	23.6	24.1	26.8	30.4	33.1	33.3
0655	24.1	24.0	24.3	26.8	30.3	33.1	33.3
0710	25.5	24.4	24.6	26.8	30.2	33.1	33.3
0725	26.8	24.6	24.9	26.8	30.1	33.0	33.3
0740	28.3	25.5	25.5	27.0	30.0	33.0	33.3
0755	31.3	26.1	26.1	27.1	30.0	33.0	33.3
0810	33.7	26.8	26.7	27.4	29.9	33.0	33.3
0825	36.6	27.7	27.5	27.4	29.9	33.0	33.3
0840	40.6	29.0	28.6	28.0	29.8	32.9	33.3
0855	42.4	30.1	29.6	28.5	29.8	32.9	33.3
0910	44.4	31.2	30.6	29.0	29.8	32.9	33.3
0925	46.0	32.3	31.6	29.6	29.8	32.8	33.3
0940	45.7	33.2	32.5	30.2	29.8	32.8	33.3
0955	45.4	33.9	33.2	30.8	29.9	32.7	33.3
1010	47.1	34.5	33.8	31.4	30.0	32.7	33.3
1025	47.9	35.3	34.5	32.0	30.1	32.7	33.3
1040	47.1	35.8	35.0	32.5	30.2	32.7	33.3
1055	48.6	36.4	35.6	33.0	30.3	32.7	33.3
1110	50.1	36.9	36.1	33.5	30.4	32.6	33.3
1125	50.4	37.2	36.7	34.0	30.6	32.6	33.3
1140	51.5	38.2	37.3	34.5	30.8	32.6	33.3
1155	52.7	38.8	37.8	35.0	30.9	32.5	33.3
1210	51.5	39.4	38.4	35.5	31.1	32.5	33.3
1225	51.2	40.0	38.7	35.9	31.3	32.5	33.3
1240	51.2	40.0	39.0	36.4	31.5	32.5	33.3
1255	50.1	40.3	39.3	36.8	31.7	32.5	33.3

20sep90.wbk

1

1415	49.5	40.4	39.5	37.1	31.9	32.5	33.3
1430	49.0	40.4	39.5	37.4	32.1	32.5	33.3
1445	47.6	40.5	39.6	37.6	32.4	32.5	33.3
1500	45.2	40.3	39.5	37.8	32.6	32.5	33.3
1515	45.3	40.0	39.3	37.9	32.8	32.5	33.3
1530	47.2	39.9	39.2	38.0	33.1	32.6	33.2
1545	46.4	40.0	39.3	38.0	33.1	32.6	33.2
1600	44.8	40.1	39.4	38.1	33.2	32.6	33.2
1615	42.5	40.0	39.3	38.2	33.4	32.5	33.2
1630	39.3	39.5	39.0	38.2	33.6	32.5	33.2
1645	37.3	38.5	38.0	38.2	33.7	32.5	33.2
1700	35.5	38.3	38.0	38.4	33.9	32.5	33.2
1715	34.2	37.5	37.3	37.9	34.0	32.6	33.2
1730	33.3	36.7	36.7	37.7	34.1	32.6	33.2
1745	32.5	36.1	36.2	37.6	34.2	32.6	33.2
1800	31.8	35.5	35.6	37.1	34.3	32.6	33.2
1815	31.1	34.9	35.1	36.8	34.3	32.6	33.2
1830	30.9	34.6	34.7	36.4	34.4	32.6	33.2
1845	30.5	34.5	34.6	36.1	34.4	32.6	33.2
1900	29.6	33.6	33.6	35.6	34.4	32.7	33.1
1915	29.6	32.2	33.5	35.5	34.4	32.7	33.1
1930	29.3	32.8	33.1	35.3	34.3	32.7	33.1
1945	29.3	32.6	32.9	35.0	34.3	32.8	33.1
2000	28.9	32.5	32.6	34.8	34.3	32.8	33.1
2015	28.5	32.7	32.0	34.5	34.2	32.9	33.1
2030	28.3	31.4	31.0	34.3	34.1	32.9	33.1
2045	27.9	31.4	31.5	33.9	34.1	32.8	33.1
2100	27.0	31.1	31.5	33.7	34.0	32.8	33.1
2115	26.4	30.8	31.1	33.7	34.0	32.8	33.1
2130	26.1	30.4	30.8	33.4	33.9	32.9	33.1
2145	25.4	30.1	30.5	33.2	33.8	32.9	33.1
2160	25.0	29.8	30.2	33.0	33.8	33.0	33.1
2175	24.5	29.5	29.9	32.8	33.7	33.0	33.1
2190	24.2	29.1	29.4	32.5	33.6	33.1	33.1
2205	23.9	28.8	29.3	32.3	33.5	33.1	33.1
2220	23.6	28.5	29.0	32.0	33.4	33.1	33.1
2235	23.3	28.2	28.8	31.8	33.3	33.1	33.1
2250	23.0	27.9	28.5	31.6	33.2	33.1	33.1
2305	22.7	27.7	28.2	31.4	33.1	33.1	33.1
2320	22.0	27.8	28.5	31.3	33.0	33.1	33.1
2335	22.9	27.7	28.2	31.3	33.1	33.1	33.1
2350	22.9	27.7	28.2	31.3	33.1	33.1	33.1
2400	22.7	27.4	28.0	31.1	33.0	33.1	33.1

1

21sep90.wbk

92/03/12  
14:52:33

TEMPERATURE DATA  
WASBANK PROFILE  
SADAM ENVIRONMENTAL AREA  
21 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	22.5	27.2	27.6	30.9	32.9	33.1	33.1
0030	22.5	27.0	27.6	30.8	32.9	33.1	33.1
0045	22.6	26.9	27.4	30.5	32.8	33.1	33.1
0100	22.6	26.7	27.2	30.4	32.7	33.1	33.1
0115	22.6	26.6	27.1	30.2	32.5	33.1	33.1
0130	22.5	26.5	27.0	30.0	32.4	33.1	33.1
0145	22.4	26.4	26.9	29.9	32.3	33.1	33.1
0200	22.3	26.3	26.7	29.7	32.2	33.1	33.1
0215	22.2	26.1	26.6	29.6	32.1	33.1	33.1
0230	22.1	26.0	26.5	29.5	32.0	33.1	33.1
0245	22.0	25.9	26.4	29.3	31.9	33.1	33.1
0300	22.0	25.8	26.2	29.2	31.8	33.1	33.1
0315	21.8	25.7	26.1	29.1	31.7	33.1	33.1
0330	21.7	25.5	26.0	28.9	31.6	33.1	33.1
0345	21.6	25.4	25.9	28.8	31.5	33.0	33.1
0400	21.4	25.3	25.8	28.7	31.5	33.0	33.1
0415	21.3	25.2	25.6	28.6	31.4	33.0	33.1
0430	21.2	25.0	25.5	28.5	31.3	33.0	33.1
0445	21.2	24.9	25.4	28.3	31.2	33.0	33.0
0500	21.2	24.8	25.3	28.2	31.1	32.9	33.0
0515	21.2	24.7	25.2	28.1	31.0	32.9	33.0
0530	21.1	24.6	25.1	28.0	30.9	32.9	33.0
0545	20.9	24.5	25.0	27.9	30.9	32.9	33.0
0600	20.8	24.4	24.9	27.8	30.8	32.9	33.0
0615	20.7	24.3	24.8	27.7	30.7	32.9	33.0
0630	20.6	24.2	24.7	27.6	30.6	32.8	33.0
0645	20.6	24.1	24.6	27.5	30.5	32.8	33.0

1

07sep90.spf

92/03/12  
14:04:53

THEMISTOR DATA  
SOIL PROFILE  
SADAM ENVIRONMENTAL AREA  
07 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0515	26.5	28.9	30.4	31.3	36.8	36.7	34.8
0530	26.4	28.8	30.3	31.2	36.7	36.7	34.8
0545	26.3	28.7	30.1	31.0	36.6	36.7	34.8
0600	26.1	28.6	30.0	30.9	36.5	36.7	34.8
0615	26.1	28.5	29.9	30.8	36.4	36.7	34.8
0630	26.1	28.5	29.8	30.7	36.3	36.7	34.8
0645	26.2	28.3	29.6	30.6	36.2	36.7	34.8
0700	26.7	28.3	29.6	30.6	36.2	36.7	34.8
0715	27.6	28.5	29.6	30.6	36.1	36.7	34.8
0730	29.0	28.8	29.7	30.2	36.0	36.7	34.8
0745	30.8	29.2	29.9	30.1	35.9	36.7	34.8
0800	32.8	29.8	30.2	30.0	35.8	36.6	34.7
0815	34.8	30.6	30.6	30.0	35.7	36.6	34.7
0830	36.8	31.5	31.1	30.1	35.7	36.6	34.6
0845	38.7	32.3	31.7	30.2	35.5	36.6	34.7
0900	40.0	33.3	32.4	30.5	35.5	36.6	34.7
0915	41.6	34.1	33.1	30.5	35.4	36.6	34.7
0930	43.4	35.1	33.8	30.7	35.4	36.6	34.7
0945	45.2	36.1	34.5	30.3	35.3	36.5	34.7
1000	47.0	37.2	35.3	30.3	35.3	36.5	34.7
1015	48.8	38.3	36.2	30.6	35.3	36.5	34.7
1030	50.4	39.3	37.0	30.0	35.3	36.4	34.7
1045	52.2	40.5	37.9	30.4	35.1	36.4	34.7
1100	53.3	41.6	38.9	30.8	35.2	36.4	34.7
1115	54.7	42.6	39.8	30.3	35.2	36.4	34.7
1130	55.5	43.6	40.7	30.8	35.2	36.4	34.7
1145	56.4	44.3	41.4	30.3	35.2	36.4	34.6
1200	57.1	45.2	42.2	30.6	35.3	36.4	34.6
1215	58.3	46.0	43.0	30.4	35.3	36.4	34.6
1230	58.6	46.8	43.8	30.9	35.4	36.4	34.7
1245	58.7	47.4	44.5	30.5	35.5	36.4	34.7
1300	59.2	47.9	45.0	30.0	35.6	36.3	34.7
1315	59.1	48.4	45.6	30.5	35.7	36.3	34.6
1330	59.0	48.6	46.0	30.0	35.8	36.2	34.6
1345	59.7	49.0	46.4	30.5	36.0	36.2	34.6
1400	59.5	49.5	46.9	30.9	36.1	36.2	34.6
1415	59.0	49.7	47.3	31.4	36.3	36.2	34.6
1430	58.9	49.8	47.5	31.7	36.4	36.2	34.6
1445	58.5	50.0	47.7	32.1	36.6	36.1	34.6
1500	57.6	50.0	48.0	32.5	36.8	36.1	34.6
1515	57.2	50.0	48.1	32.8	37.0	36.1	34.6
1530	56.7	49.9	48.1	33.2	37.1	36.1	34.6
1545	56.0	49.8	48.2	33.4	37.3	36.1	34.6
1600	55.4	49.5	48.2	33.7	37.5	36.1	34.6
1615	54.8	49.3	48.1	33.9	37.7	36.1	34.6
1630	53.8	49.0	47.9	34.1	37.7	36.1	34.6
1645	52.7	48.6	47.9	34.3	38.2	36.1	34.6
1700	51.0	48.1	47.5	34.3	38.2	36.1	34.6
1715	50.0	47.5	47.1	34.3	38.4	36.1	34.6
1730	50.0	46.9	46.8	34.4	38.6	36.1	34.6
1745	50.0	46.9	46.8	34.4	38.6	36.1	34.6
1800	50.0	45.6	45.8	34.3	38.9	36.1	34.6
1815	44.2	45.6	45.3	34.2	39.0	36.1	34.6
1830	42.7	44.0	44.9	34.0	39.2	36.1	34.6
1845	41.3	43.2	44.2	33.9	39.2	36.1	34.6
1900	40.2	42.5	44.2	33.7	39.4	36.1	34.6

1915	39.2	41.8	43.5	43.0	39.5	36.1	34.6
1930	38.5	41.1	43.2	42.4	39.6	36.1	34.6
1945	37.9	40.6	43.0	42.0	39.7	36.1	34.6
2000	37.3	40.0	42.7	41.5	39.8	36.1	34.6
2015	36.8	39.5	42.4	41.0	39.8	36.1	34.6
2030	36.2	39.1	42.1	40.5	39.9	36.2	34.6
2045	35.9	38.7	42.0	40.2	39.9	36.2	34.6
2100	35.9	38.7	41.9	40.2	39.9	36.2	34.6
2115	35.0	37.9	41.4	39.4	39.9	36.2	34.6
2130	34.7	37.5	41.1	39.0	39.9	36.2	34.6
2145	34.3	37.1	40.8	38.7	39.9	36.2	34.6
2200	34.0	36.5	40.6	38.1	39.9	36.2	34.6
2215	34.0	36.2	40.4	37.8	39.9	36.3	34.6
2230	33.3	36.2	40.1	37.5	39.8	36.4	34.6
2245	33.0	35.9	39.6	37.2	39.8	36.4	34.6
2300	32.7	35.6	39.4	36.9	39.7	36.4	34.6
2315	32.4	35.3	39.1	36.6	39.7	36.4	34.6
2330	32.2	35.0	38.8	36.4	39.7	36.4	34.6
2345	32.0	34.8	38.7	36.4	39.7	36.4	34.6
2400	31.7	34.5	38.7	36.4	39.6	36.4	34.6

9203/12  
14:05:05

08sep90.spf

1

THEMISTOR DATA  
SOIL PROFILE  
SADAM ENVIRONMENTAL AREA  
08 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hrs	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0010	31.3	34.0	35.6	38.3	39.4	36.4	34.6
0045	31.0	33.8	35.4	38.1	39.4	36.4	34.6
0100	31.0	33.8	35.4	38.1	39.4	36.5	34.6
0115	30.5	33.8	34.9	37.7	39.2	36.5	34.6
0130	30.4	33.1	34.7	37.5	39.1	36.5	34.6
0145	30.1	32.9	34.5	37.2	39.0	36.6	34.6
0200	30.0	32.7	34.2	37.0	38.9	36.6	34.6
0215	29.8	32.5	34.0	36.9	38.9	36.6	34.6
0230	29.6	32.3	33.9	36.7	38.8	36.7	34.6
0245	29.4	32.1	33.7	36.6	38.8	36.7	34.6
0300	29.2	31.9	33.5	36.4	38.7	36.7	34.6
0315	29.0	31.7	33.3	36.2	38.6	36.7	34.6
0330	28.8	31.5	33.1	36.0	38.5	36.7	34.6
0345	28.6	31.4	32.9	35.8	38.4	36.7	34.6
0400	28.5	31.2	32.7	35.7	38.3	36.7	34.6
0415	28.3	31.0	32.5	35.5	38.2	36.7	34.6
0430	28.2	30.8	32.4	35.3	38.1	36.7	34.6
0445	28.0	30.7	32.2	35.2	38.0	36.7	34.6
0500	27.8	30.5	32.0	35.0	37.9	36.7	34.6
0515	27.6	30.3	31.9	34.8	37.8	36.7	34.6
0530	27.5	30.2	31.7	34.6	37.6	36.7	34.6
0545	27.3	30.0	31.5	34.5	37.7	36.7	34.6
0560	27.5	30.0	31.5	34.5	37.7	36.7	34.6
0600	27.5	30.0	31.5	34.5	37.7	36.7	34.6
0615	27.2	29.5	31.0	34.0	37.3	36.7	34.6
0630	27.9	29.5	30.9	33.6	37.3	36.8	34.6
0645	28.7	29.8	30.8	33.7	37.2	36.8	34.6
0715	29.5	30.6	31.5	34.5	37.1	36.8	34.6
0745	31.3	32.4	33.4	35.4	36.9	36.8	34.6
0800	31.3	32.4	33.4	35.4	36.9	36.8	34.6
0815	34.8	31.9	31.8	33.3	36.8	36.8	34.6
0830	36.6	32.8	32.4	33.4	36.7	36.8	34.6
0845	38.3	33.8	32.9	33.4	36.6	36.7	34.6
0900	40.0	34.8	33.6	33.6	36.5	36.7	34.6
0915	41.7	35.8	34.3	33.8	36.5	36.7	34.6
0930	43.4	36.8	35.1	34.0	36.4	36.8	34.6
0945	45.2	37.6	35.8	34.2	36.3	36.7	34.6
1000	47.1	39.0	36.7	34.9	36.3	36.7	34.6
1015	48.5	40.1	37.4	34.9	36.2	36.7	34.6
1030	50.3	41.1	38.4	35.2	36.1	36.7	34.6
1045	51.6	42.2	39.3	35.6	36.1	36.7	34.6
1100	53.0	43.3	40.2	36.1	36.2	36.7	34.6
1115	54.4	44.3	41.1	36.9	36.1	36.7	34.6
1130	55.6	45.3	42.0	37.0	36.2	36.7	34.6
1145	56.6	46.2	42.8	37.6	36.2	36.7	34.6
1200	57.5	47.0	43.6	38.0	36.2	36.6	34.5
1215	58.2	47.8	44.3	38.6	36.3	36.6	34.5
1230	58.9	48.5	45.1	39.1	36.4	36.6	34.6
1245	59.5	49.1	45.8	39.7	36.5	36.6	34.5
1300	59.8	49.6	46.3	40.2	36.5	36.5	34.5
1315	60.0	50.1	46.8	40.7	36.6	36.5	34.5
1330	59.9	50.6	47.4	41.2	36.8	36.5	34.5
1345	60.2	50.9	47.8	41.7	36.9	36.5	34.5
1400	60.1	51.3	48.2	42.1	37.1	36.5	34.6
1415	59.9	51.4	48.5	42.6	37.2	36.5	34.6
1430	59.6	51.5	48.8	43.0	37.4	36.5	34.6

1445	58.7	51.5	49.0	43.4	37.6	36.5	34.6
1500	59.2	51.5	49.1	43.7	37.7	36.5	34.6
1515	58.0	51.5	49.2	44.0	37.9	36.5	34.6
1530	57.3	51.4	49.2	44.3	38.1	36.4	34.6
1545	57.0	51.1	49.2	44.6	38.3	36.4	34.6
1600	55.2	50.8	49.1	44.8	38.5	36.4	34.6
1615	54.1	50.2	48.8	44.9	38.7	36.4	34.6
1630	53.6	49.8	48.6	45.0	38.8	36.4	34.6
1645	52.6	49.3	48.3	45.1	39.0	36.4	34.5
1700	51.1	48.8	47.9	45.1	39.1	36.4	34.5
1715	49.9	48.2	47.4	45.2	39.3	36.4	34.5
1730	48.6	47.6	47.3	45.2	39.5	36.4	34.6
1745	47.1	46.9	46.6	45.1	39.7	36.4	34.6
1800	45.7	46.2	46.3	45.0	39.8	36.4	34.6
1815	44.3	45.4	45.8	44.9	39.9	36.4	34.6
1830	42.7	44.6	45.2	44.7	40.0	36.4	34.6
1845	41.3	43.8	44.7	44.5	40.1	36.4	34.6
1900	40.2	43.0	44.1	44.3	40.2	36.4	34.5
1915	39.2	42.3	43.5	44.1	40.3	36.4	34.6
1930	38.3	41.6	42.9	43.8	40.4	36.4	34.6
1945	37.6	41.0	42.4	43.6	40.5	36.5	34.5
2000	36.9	40.4	41.9	43.3	40.6	36.5	34.6
2015	36.3	39.8	41.4	43.0	40.6	36.5	34.6
2030	35.7	39.3	40.9	42.8	40.6	36.5	34.6
2045	35.2	38.8	40.5	42.5	40.7	36.6	34.6
2100	34.6	38.4	40.1	42.2	40.7	36.6	34.6
2115	34.1	37.9	39.6	41.9	40.7	36.6	34.6
2130	33.7	37.5	39.2	41.5	40.6	36.6	34.6
2145	33.3	37.1	38.8	41.3	40.6	36.6	34.6
2200	32.9	36.7	38.5	41.1	40.4	36.7	34.6
2215	32.5	36.3	38.2	40.8	40.6	36.7	34.6
2230	32.1	35.9	37.8	40.5	40.5	36.7	34.6
2245	31.6	35.5	37.4	40.2	40.5	36.7	34.6
2260	31.4	35.3	37.1	40.0	40.4	36.7	34.6
2310	31.6	35.3	37.1	39.7	40.4	36.8	34.6
2330	30.9	34.6	36.5	39.5	40.3	36.8	34.6
2345	30.6	34.3	36.2	39.2	40.2	36.8	34.6
2400	30.4	34.3	35.9	39.0	40.2	36.8	34.6

920312  
14:05:18

THEMISTOR DATA  
SOIL PROFILE  
SADONH ENVIRONMENTAL AREA  
09 SEP 1990

TIME	0.0m	-2.5m	-5.0m	-10.0m	-20.0m	-40.0m	-70.0m
hr:mm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	30.4	31.0	31.6	38.7	40.1	38.9	34.6
0030	30.1	34.3	35.2	38.5	40.0	36.9	34.6
0045	29.9	33.3	35.3	38.2	39.9	36.9	34.6
0100	29.6	33.1	35.3	38.0	39.8	36.9	34.6
0115	29.3	32.8	34.8	37.8	39.7	36.9	34.6
0130	29.1	32.6	34.6	37.6	39.6	36.9	34.6
0145	29.0	32.3	34.3	37.3	39.5	36.9	34.6
0200	28.5	32.2	34.0	37.2	39.4	36.9	34.6
0215	28.7	32.0	33.8	37.0	39.4	37.0	34.6
0230	28.5	32.0	33.6	36.8	39.3	37.0	34.6
0245	28.2	31.6	33.6	36.6	39.2	37.0	34.6
0300	28.1	31.4	33.3	36.4	39.1	37.0	34.6
0315	27.9	31.2	32.9	36.2	39.0	37.0	34.6
0330	27.7	31.0	32.7	36.0	38.9	37.1	34.6
0345	27.4	31.0	32.5	35.8	38.8	37.1	34.6
0400	27.3	30.8	32.3	35.6	38.7	37.1	34.6
0415	27.2	30.6	32.2	35.5	38.6	37.1	34.6
0430	27.0	30.2	32.0	35.3	38.5	37.1	34.6
0445	26.9	30.1	31.8	35.3	38.4	37.1	34.6
0455	26.9	30.1	31.8	35.3	38.4	37.1	34.6
0510	26.8	29.9	31.5	35.2	38.3	37.1	34.6
0520	26.6	29.7	31.4	35.0	38.2	37.2	34.6
0530	26.4	29.5	31.2	34.8	38.0	37.2	34.6
0545	26.4	29.3	31.1	34.5	37.8	37.2	34.6
0600	26.4	29.3	31.1	34.3	37.6	37.2	34.6
0615	26.2	29.2	30.9	34.2	37.4	37.2	34.6
0630	26.1	29.1	30.8	34.0	37.2	37.2	34.6
0645	26.3	29.0	30.8	33.9	37.1	37.2	34.6
0700	26.9	29.0	30.5	33.7	37.0	37.1	34.6
0715	27.8	29.2	30.5	33.5	37.0	37.1	34.6
0730	28.8	29.5	30.5	33.4	37.0	37.1	34.6
0745	29.9	30.0	30.7	33.6	37.3	37.2	34.6
0800	32.2	31.0	31.0	33.3	37.1	37.2	34.6
0815	33.7	31.5	31.4	33.3	37.0	37.1	34.6
0830	35.4	32.3	31.9	33.3	36.9	37.1	34.6
0845	37.1	33.2	32.9	33.2	36.9	37.2	34.6
0900	39.9	34.1	33.0	33.4	36.7	37.2	34.6
0915	40.8	35.2	33.7	33.6	36.7	37.2	34.6
0930	42.3	36.3	34.5	33.8	36.6	37.1	34.6
0945	43.6	37.2	35.2	34.0	36.5	37.1	34.6
1000	45.2	38.2	36.0	34.2	36.4	37.0	34.6
1015	46.9	39.2	36.8	34.6	36.4	37.1	34.6
1030	48.2	40.3	37.6	34.9	36.4	37.1	34.6
1045	49.6	41.7	38.3	35.2	36.3	37.0	34.6
1100	51.0	42.3	39.2	35.7	36.3	37.0	34.6
1115	52.4	43.3	40.0	36.1	36.3	37.0	34.6
1130	53.5	44.2	40.8	36.5	36.3	37.0	34.6
1145	54.6	45.1	41.6	37.0	36.4	37.0	34.6
1200	55.4	45.9	42.4	37.4	36.4	37.0	34.6
1215	56.5	46.8	43.1	37.9	36.4	37.0	34.6
1230	57.2	47.5	43.8	38.4	36.4	36.9	34.6
1245	57.6	48.2	44.5	38.9	36.5	36.9	34.6
1300	58.3	48.7	45.1	39.4	36.6	36.9	34.6
1315	59.3	49.3	45.7	39.9	36.7	36.9	34.6
1330	59.0	49.8	46.2	40.3	36.8	36.9	34.6
1345	59.1	50.2	46.6	40.8	36.9	36.8	34.6
1400	59.2	50.5	47.0	41.2	37.0	36.8	34.6

09sep90.spf

1

1415	59.3	50.8	47.4	41.6	37.1	36.8	34.6
1430	59.4	51.1	47.8	42.1	37.3	36.8	34.6
1445	59.0	51.4	48.1	42.5	37.5	36.8	34.6
1500	58.3	51.4	48.3	42.8	37.6	36.8	34.6
1515	58.0	51.3	48.4	43.2	37.8	36.8	34.6
1530	57.7	51.3	48.5	43.5	37.9	36.8	34.6
1545	57.5	51.2	48.6	43.7	38.1	36.7	34.6
1600	56.5	51.0	48.5	43.9	38.2	36.7	34.6
1615	55.3	50.6	48.5	44.1	38.4	36.7	34.6
1630	54.5	50.2	48.2	44.3	38.5	36.7	34.6
1645	53.5	49.8	48.2	44.5	38.7	36.7	34.6
1700	52.4	49.3	47.9	44.6	38.9	36.7	34.6
1715	51.1	48.8	47.6	44.7	39.1	36.7	34.6
1730	49.3	48.2	47.3	44.7	39.2	36.7	34.6
1745	47.7	47.4	46.9	44.7	39.4	36.7	34.6
1800	46.2	46.6	46.4	44.7	39.5	36.7	34.6
1815	44.6	45.8	45.9	44.6	39.6	36.7	34.6
1830	43.1	45.0	45.3	44.5	39.8	36.7	34.6
1845	41.8	44.2	44.8	44.3	39.9	36.7	34.6
1900	40.6	43.4	44.2	44.2	40.0	36.7	34.6
1915	39.5	42.8	43.7	43.9	40.1	36.7	34.6
1930	38.7	42.0	43.2	43.8	40.2	36.7	34.6
1945	38.0	41.3	42.6	43.5	40.3	36.7	34.6
2000	37.3	40.7	42.1	43.2	40.3	36.7	34.6
2015	36.8	40.2	41.7	43.0	40.4	36.8	34.6
2030	36.1	39.7	41.2	42.7	40.5	36.7	34.6
2045	35.6	39.2	40.7	42.5	40.5	36.7	34.6
2100	35.2	38.7	40.3	42.2	40.6	36.8	34.7
2115	35.9	38.5	40.0	42.0	40.6	36.8	34.6
2130	35.7	38.3	39.7	41.7	40.5	36.8	34.6
2145	35.2	38.1	39.4	41.4	40.5	36.8	34.6
2200	34.8	37.8	39.1	41.2	40.5	36.9	34.6
2215	34.4	37.4	38.6	41.0	40.5	36.9	34.6
2230	33.9	37.1	38.3	40.7	40.6	36.9	34.7
2245	33.7	36.8	38.0	40.5	40.6	37.0	34.7
2300	33.0	36.2	37.5	40.1	40.3	37.0	34.6
2315	32.7	35.9	37.5	39.9	40.3	37.0	34.6
2330	32.7	35.9	37.5	39.9	40.3	37.0	34.6
2345	32.4	35.6	37.2	39.7	40.2	37.0	34.6
2400	32.2	35.3	36.9	39.4	40.2	37.0	34.6

1

10sep90.spf

92/03/12  
14:02:58

TRANSMITTER DATA  
SOIL PROFILES  
SALARM ENVIRONMENTAL AREA  
10 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
h:mm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	32.0	35.1	36.7	39.2	40.1	37.0	34.6
0030	31.8	34.9	36.4	39.0	40.0	37.0	34.6
0045	31.4	34.6	36.2	38.8	40.0	37.0	34.6
0100	31.1	34.4	36.0	38.6	39.9	37.1	34.7
0115	30.8	34.1	35.8	38.5	39.9	37.1	34.7
0130	30.5	33.9	35.5	38.3	39.8	37.1	34.7
0145	30.3	33.6	35.3	38.0	39.7	37.1	34.7
0200	30.0	33.4	35.0	37.9	39.6	37.2	34.7
0215	29.7	33.1	34.8	37.7	39.5	37.2	34.6
0230	29.5	32.9	34.6	37.5	39.5	37.2	34.6
0245	29.3	32.6	34.3	37.3	39.3	37.2	34.6
0300	29.0	32.4	34.1	37.1	39.1	37.2	34.6
0315	28.8	32.2	33.9	36.9	39.2	37.2	34.7
0330	28.5	32.0	33.6	36.8	39.2	37.2	34.7
0345	28.3	31.8	33.5	36.6	39.1	37.2	34.7
0400	28.2	31.6	33.3	36.4	39.0	37.2	34.7
0415	28.1	31.4	33.1	36.2	38.9	37.2	34.7
0430	28.0	31.2	32.9	36.0	38.8	37.2	34.7
0445	27.9	31.1	32.7	35.8	38.7	37.2	34.7
0500	27.6	30.9	32.6	35.7	38.6	37.2	34.7
0515	27.2	30.7	32.4	35.5	38.5	37.2	34.7
0530	27.0	30.5	32.2	35.3	38.4	37.2	34.7
0545	26.8	30.2	32.0	35.2	38.3	37.2	34.7
0600	26.6	30.0	31.8	35.0	38.2	37.2	34.6
0615	26.5	29.9	31.6	34.8	38.1	37.2	34.6
0630	26.3	29.7	31.5	34.7	38.0	37.3	34.7
0645	26.5	29.6	31.3	34.6	38.0	37.3	34.7
0700	27.0	29.5	31.2	34.4	37.9	37.3	34.7
0715	28.1	29.7	31.1	34.3	37.8	37.3	34.7
0730	29.4	30.1	31.2	34.1	37.7	37.3	34.7
0745	31.0	30.6	31.3	34.0	37.6	37.2	34.6
0800	32.5	31.3	31.6	33.9	37.5	37.2	34.7
0815	31.8	32.1	32.0	33.9	37.4	37.3	34.7
0830	35.5	32.9	32.5	33.9	37.3	37.3	34.7
0845	36.9	33.7	32.9	33.9	37.2	37.2	34.7
0900	38.5	34.6	33.5	34.0	37.1	37.2	34.7
0915	40.1	35.5	34.2	34.1	37.1	37.2	34.7
0930	41.8	36.5	34.8	34.3	37.0	37.3	34.7
0945	43.5	37.5	35.5	34.5	36.9	37.2	34.7
1000	45.2	38.6	36.2	34.7	36.8	37.2	34.7
1015	47.1	39.7	37.0	35.0	36.8	37.2	34.7
1030	48.8	40.8	37.8	35.3	36.7	37.2	34.7
1045	50.2	42.0	38.7	35.6	36.7	37.2	34.7
1100	51.6	43.0	39.6	36.0	36.7	37.2	34.7
1115	52.9	44.0	40.4	36.4	36.6	37.2	34.6
1130	54.1	45.0	41.2	36.8	36.7	37.2	34.6
1145	54.9	45.9	42.1	37.3	36.7	37.2	34.7
1200	55.8	46.8	42.8	37.8	36.7	37.2	34.7
1215	56.4	47.4	43.5	38.2	36.7	37.1	34.7
1230	57.2	48.1	44.2	38.7	36.8	37.1	34.6
1245	58.0	48.8	44.8	39.2	36.8	37.1	34.7
1300	58.2	49.4	45.4	39.7	36.9	37.1	34.7
1315	58.8	49.9	45.9	40.1	37.0	37.0	34.7
1330	59.1	50.4	46.4	40.5	37.1	37.0	34.6
1345	59.5	50.8	46.9	41.0	37.2	37.0	34.7
1400	59.5	51.3	47.4	41.5	37.3	37.0	34.7

1415	59.5	51.5	47.8	41.9	37.5	37.0	34.7
1430	59.4	51.6	48.1	42.3	37.5	37.0	34.7
1445	59.0	51.7	48.3	42.6	37.7	37.0	34.6
1500	58.8	51.8	48.5	43.0	37.8	37.0	34.6
1515	58.2	51.8	48.7	43.3	38.0	37.0	34.6
1530	57.6	52.4	48.7	43.6	38.2	36.9	34.6
1545	56.6	51.4	48.7	43.9	38.3	36.9	34.6
1600	56.2	51.3	48.7	44.1	38.5	36.9	34.6
1615	55.6	51.0	48.6	44.3	38.7	36.9	34.6
1630	54.5	50.7	48.5	44.5	38.8	36.9	34.7
1645	53.4	50.3	48.4	44.6	39.0	36.9	34.7
1700	52.2	49.7	48.2	44.8	39.2	36.9	34.7
1715	51.2	49.2	47.9	44.8	39.2	36.9	34.7
1730	49.6	48.6	47.5	44.9	39.5	36.9	34.7
1745	48.2	47.2	47.1	44.9	39.6	36.9	34.7
1800	46.7	46.2	46.7	44.9	39.7	36.9	34.7
1815	45.3	45.4	46.2	44.7	39.9	36.9	34.7
1830	43.8	45.6	45.7	44.6	40.0	36.9	34.6
1845	42.3	44.8	45.2	44.5	40.1	36.9	34.7
1900	41.2	44.0	44.7	44.4	40.2	36.9	34.7
1915	40.1	43.2	44.1	44.2	40.3	36.9	34.7
1930	39.4	42.5	43.6	44.0	40.4	36.9	34.7
1945	38.7	41.9	43.1	43.8	40.5	37.0	34.7
2000	38.0	41.3	42.6	43.3	40.6	36.9	34.7
2015	37.3	40.8	42.1	43.3	40.6	36.9	34.7
2030	36.7	40.3	41.7	43.0	40.7	37.0	34.7
2100	35.4	39.2	40.8	42.5	40.8	37.0	34.7
2115	34.9	38.7	40.4	42.2	40.7	37.0	34.7
2130	34.6	38.3	40.0	42.0	40.8	37.0	34.8
2145	33.9	37.8	39.6	41.8	40.8	37.0	34.8
2200	33.5	37.4	39.5	41.6	40.8	37.0	34.7
2215	33.2	37.0	39.3	41.5	40.8	37.0	34.7
2230	32.8	36.6	38.5	41.3	40.7	37.0	34.7
2245	32.4	36.3	38.2	41.0	40.7	37.1	34.8
2300	32.1	36.0	37.9	40.5	40.6	37.2	34.8
2315	31.8	35.6	37.5	40.2	40.5	37.2	34.8
2330	31.5	35.3	37.2	40.0	40.5	37.2	34.8
2345	31.2	35.0	36.9	39.7	40.5	37.2	34.8
2400	31.0	34.7	36.6	39.5	40.4	37.2	34.7



92/03/12  
14:05:35

1

11sep90.spf

TEHRANISTAN DATA  
SOIL PROFILE  
SADAM ENVIRONMENTAL AREA  
11 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
Hum	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	30.6	34.4	36.3	39.2	40.3	37.2	34.7
0030	30.3	34.2	36.1	39.1	40.3	37.2	34.6
0045	30.1	33.9	35.9	38.8	40.2	37.2	34.6
0100	29.9	33.6	35.6	38.6	40.1	37.3	34.6
0115	29.7	33.4	35.3	38.4	40.1	37.3	34.6
0130	29.5	33.2	35.1	38.2	40.0	37.3	34.6
0145	29.2	32.9	34.8	38.0	39.9	37.3	34.6
0200	28.9	32.6	34.6	37.7	39.8	37.3	34.6
0215	28.6	32.4	34.3	37.5	39.7	37.3	34.6
0230	28.3	32.1	34.1	37.3	39.6	37.3	34.7
0245	28.1	31.9	33.9	37.2	39.5	37.4	34.8
0300	27.8	31.7	33.7	37.0	39.5	37.4	34.8
0315	27.5	31.4	33.5	36.8	39.4	37.4	34.8
0330	27.3	31.2	33.2	36.6	39.3	37.4	34.8
0345	27.1	31.0	33.0	36.4	39.2	37.4	34.8
0400	26.9	30.7	32.8	36.2	39.1	37.4	34.8
0415	26.6	30.5	32.5	36.0	39.0	37.5	34.8
0430	26.4	30.3	32.3	35.8	38.9	37.5	34.8
0445	26.2	30.1	32.1	35.6	38.9	37.5	34.8
0500	26.0	29.9	31.9	35.4	38.7	37.5	34.8
0515	25.8	29.7	31.7	35.2	38.6	37.5	34.8
0530	25.6	29.5	31.5	35.0	38.5	37.6	34.8
0545	25.4	29.3	31.3	34.8	38.3	37.6	34.8
0600	25.2	29.1	31.1	34.6	38.1	37.5	34.8
0615	25.0	28.9	30.9	34.4	38.0	37.5	34.8
0630	24.8	28.7	30.7	34.2	37.8	37.5	34.8
0645	24.6	28.5	30.5	34.0	37.8	37.6	34.8
0700	24.4	28.3	30.3	33.8	37.7	37.6	34.8
0715	24.2	28.1	30.1	33.6	37.7	37.6	34.8
0730	24.0	27.9	29.9	33.4	37.7	37.6	34.8
0745	23.8	27.7	29.7	33.2	37.7	37.6	34.8
0800	23.6	27.5	29.5	33.0	37.7	37.6	34.8
0815	23.4	27.3	29.3	32.8	37.7	37.6	34.8
0830	23.2	27.1	29.1	32.6	37.7	37.6	34.8
0845	23.0	26.9	28.9	32.4	37.7	37.6	34.8
0900	22.8	26.7	28.7	32.2	37.7	37.6	34.8
0915	22.6	26.5	28.5	32.0	37.7	37.6	34.8
0930	22.4	26.3	28.3	31.8	37.7	37.6	34.8
0945	22.2	26.1	28.1	31.6	37.7	37.6	34.8
1000	22.0	25.9	27.9	31.4	37.7	37.6	34.8
1015	21.8	25.7	27.7	31.2	37.7	37.6	34.8
1030	21.6	25.5	27.5	31.0	37.7	37.6	34.8
1045	21.4	25.3	27.3	30.8	37.7	37.6	34.8
1100	21.2	25.1	27.1	30.6	37.7	37.6	34.8
1115	21.0	24.9	26.9	30.4	37.7	37.6	34.8
1130	20.8	24.7	26.7	30.2	37.7	37.6	34.8
1145	20.6	24.5	26.5	30.0	37.7	37.6	34.8
1200	20.4	24.3	26.3	29.8	37.7	37.6	34.8
1215	20.2	24.1	26.1	29.6	37.7	37.6	34.8
1230	20.0	23.9	25.9	29.4	37.7	37.6	34.8
1245	19.8	23.7	25.7	29.2	37.7	37.6	34.8
1300	19.6	23.5	25.5	29.0	37.7	37.6	34.8
1315	19.4	23.3	25.3	28.8	37.7	37.6	34.8
1330	19.2	23.1	25.1	28.6	37.7	37.6	34.8
1345	19.0	22.9	24.9	28.4	37.7	37.6	34.8
1400	18.8	22.7	24.7	28.2	37.7	37.6	34.8

1415	58.4	51.8	48.0	41.9	37.4	37.1	34.8
1430	58.4	51.8	48.2	42.2	37.6	37.1	34.7
1445	58.0	51.7	48.3	42.6	37.7	37.1	34.8
1500	57.5	51.6	48.4	43.0	37.9	37.1	34.8
1515	56.7	51.4	48.5	43.2	38.0	37.1	34.8
1530	56.2	51.3	48.5	43.5	38.2	37.1	34.8
1545	55.8	51.2	48.4	43.7	38.4	37.0	34.8
1600	55.4	50.9	48.4	43.9	38.5	37.0	34.8
1615	54.3	50.6	48.3	44.1	38.7	37.0	34.8
1630	53.3	50.2	48.2	44.2	38.8	37.0	34.8
1645	52.4	49.8	48.0	44.3	39.0	37.0	34.8
1700	51.2	49.2	47.7	44.4	39.2	37.0	34.8
1715	49.9	48.6	47.4	44.5	39.3	37.0	34.8
1730	48.3	48.0	47.0	44.5	39.4	37.0	34.8
1745	47.0	47.3	46.6	44.5	39.4	37.0	34.8
1800	45.5	46.5	46.2	44.4	39.7	37.0	34.8
1815	44.0	45.7	45.7	44.3	39.8	37.0	34.8
1830	42.5	44.8	45.2	44.2	39.9	37.0	34.8
1845	41.1	44.0	44.7	44.1	40.1	37.0	34.8
1900	39.8	43.2	44.3	43.9	40.2	37.0	34.8
1915	38.7	42.3	43.5	43.7	40.2	37.0	34.8
1930	38.0	41.7	43.0	43.6	40.3	37.0	34.8
1945	36.8	41.2	42.4	43.3	40.4	37.0	34.8
2000	36.3	41.0	42.1	43.0	40.4	37.0	34.8
2015	37.9	40.7	41.8	42.8	40.5	37.1	34.8
2030	37.3	40.3	41.5	42.6	40.6	37.1	34.8
2045	36.7	39.9	41.1	42.4	40.6	37.1	34.8
2100	36.0	39.5	40.8	42.1	40.6	37.1	34.8
2115	35.6	39.0	40.6	42.0	40.6	37.1	34.8
2130	35.0	38.6	40.1	41.7	40.7	37.2	34.8
2145	34.5	38.2	40.1	41.5	40.8	37.2	34.8
2200	34.0	37.7	39.7	41.3	40.9	37.2	34.8
2215	33.5	37.3	39.3	41.0	41.0	37.2	34.8
2230	33.1	37.0	38.7	40.8	41.1	37.2	34.8
2245	32.6	36.6	38.4	40.6	41.2	37.2	34.8
2300	32.3	36.2	38.0	40.4	41.3	37.2	34.8
2315	32.1	35.9	37.7	40.1	41.4	37.2	34.8
2330	31.8	35.6	37.4	39.9	41.5	37.2	34.8
2345	31.5	35.3	37.1	39.7	41.6	37.2	34.8
2400	31.0	35.0	36.8	39.4	41.7	37.2	34.8

92/03/12  
14:05:43

1  
THERMISTOR DATA  
SOIL PROFILE  
SADARM ENVIRONMENTAL AREA  
12 SEP 1990

12sep90.spf

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	30.8	34.7	36.6	38.2	40.2	37.3	34.9
0030	30.3	34.4	36.3	38.1	40.2	37.4	34.9
0045	29.8	34.0	36.0	38.0	40.1	37.4	34.9
0100	29.3	33.6	35.7	38.0	40.0	37.4	34.8
0115	29.0	33.3	35.4	38.4	39.2	37.4	34.8
0130	28.7	33.0	35.1	38.2	39.5	37.4	34.8
0145	28.3	32.7	34.8	37.9	39.8	37.4	34.8
0200	27.9	32.3	34.5	37.7	39.7	37.4	34.8
0215	27.5	32.0	34.2	37.5	39.6	37.4	34.8
0230	27.3	31.7	34.0	37.3	39.6	37.5	34.9
0245	27.0	31.4	33.7	37.1	39.5	37.5	34.9
0300	26.8	31.1	33.4	36.9	39.4	37.5	34.9
0315	26.6	30.9	33.2	36.7	39.3	37.5	34.8
0330	26.4	30.6	32.9	36.4	39.2	37.5	34.8
0345	26.3	30.4	32.7	36.2	39.1	37.5	34.8
0400	26.4	30.2	32.5	36.0	39.0	37.5	34.8
0415	26.1	30.1	32.3	35.8	38.9	37.5	34.8
0430	25.9	29.9	32.1	35.6	38.8	37.5	34.8
0445	25.7	29.7	31.9	35.4	38.7	37.5	34.8
0500	25.6	29.5	31.7	35.3	38.7	37.5	34.9
0515	25.7	29.4	31.5	35.1	38.5	37.6	34.9
0530	25.5	29.3	31.4	34.9	38.4	37.6	34.9
0545	25.3	29.1	31.2	34.8	38.3	37.6	34.9
0600	25.2	28.9	31.0	34.6	38.2	37.6	34.9
0615	25.3	28.8	30.9	34.4	38.1	37.6	34.9
0630	25.4	28.7	30.7	34.2	38.0	37.6	34.9
0645	25.6	28.7	30.6	34.1	37.9	37.6	34.9
0700	26.3	28.6	30.5	33.9	37.8	37.6	34.9
0715	27.3	29.0	30.3	33.8	37.7	37.6	34.9
0730	28.3	29.4	30.6	33.7	37.6	37.6	34.9
0745	30.0	29.9	30.8	33.6	37.5	37.6	34.9
0800	31.5	30.6	31.1	33.5	37.4	37.6	34.9
0815	33.4	31.5	31.3	33.4	37.3	37.6	34.9
0830	35.2	33.4	32.4	33.4	37.2	37.6	34.9
0845	37.0	35.3	34.4	33.3	37.1	37.6	34.9
0900	38.7	37.4	36.4	33.2	37.0	37.5	34.8
0915	40.8	39.6	38.7	33.1	36.9	37.5	34.8
0930	42.8	41.7	40.6	33.0	36.8	37.5	34.9
0945	44.4	43.0	41.5	32.9	36.8	37.5	34.9
1000	46.4	45.0	43.2	32.8	36.7	37.5	34.9
1015	48.0	46.4	44.6	32.6	36.6	37.5	34.9
1030	49.6	48.1	46.1	32.5	36.6	37.5	34.9
1045	50.9	49.7	47.5	32.4	36.6	37.5	34.9
1100	51.5	50.6	48.4	32.3	36.5	37.5	34.9
1115	52.2	51.4	49.2	32.2	36.5	37.4	34.8
1130	53.0	52.3	50.1	32.1	36.5	37.4	34.8
1145	53.5	52.8	50.6	32.0	36.5	37.4	34.8
1200	54.3	53.6	51.4	31.9	36.5	37.3	34.8
1215	55.0	54.3	52.1	31.8	36.5	37.3	34.8
1230	55.8	55.1	52.9	31.7	36.5	37.3	34.8
1245	56.1	55.4	53.2	31.6	36.5	37.3	34.8
1300	56.1	55.3	53.1	31.5	36.5	37.3	34.8
1315	56.1	55.3	53.1	31.5	36.5	37.3	34.8
1330	56.1	55.3	53.1	31.5	36.5	37.3	34.8
1345	56.1	55.3	53.1	31.5	36.5	37.3	34.8
1400	56.1	55.3	53.1	31.5	36.5	37.3	34.8

1415	58.4	51.5	47.6	41.5	37.3	37.2	34.9
1430	57.9	51.5	47.6	41.8	37.4	37.1	34.9
1445	57.5	51.4	48.0	42.2	37.5	37.1	34.8
1500	57.5	51.4	48.1	42.5	37.7	37.1	34.8
1515	56.7	51.4	48.2	42.8	37.9	37.1	34.8
1530	56.2	51.3	48.3	43.1	38.0	37.1	34.8
1545	55.4	51.1	48.3	43.3	38.2	37.1	34.8
1600	55.3	50.8	48.3	43.5	38.3	37.1	34.8
1615	54.0	50.6	48.2	43.7	38.5	37.1	34.8
1630	52.9	50.1	48.1	43.9	38.7	37.1	34.8
1645	51.7	49.6	47.9	44.0	38.8	37.1	34.8
1700	50.6	49.0	47.6	44.1	39.0	37.1	34.8
1715	49.5	48.4	47.3	44.1	39.1	37.0	34.9
1730	47.9	47.8	46.9	44.1	39.2	37.0	34.9
1745	46.7	47.0	46.5	44.1	39.4	37.0	34.8
1800	45.2	46.3	46.1	44.1	39.5	37.0	34.8
1815	43.7	45.3	45.6	44.0	39.6	37.0	34.8
1830	42.4	44.7	45.0	43.9	39.7	37.0	34.8
1845	41.2	43.9	44.5	43.8	39.8	37.0	34.9
1900	40.2	43.2	44.0	43.7	40.0	37.0	34.9
1915	39.3	42.5	43.5	43.5	40.1	37.0	34.9
1930	38.7	41.9	43.0	43.2	40.2	37.1	34.9
1945	38.2	41.4	42.6	43.1	40.3	37.1	34.9
2000	37.7	40.9	42.1	42.8	40.3	37.1	34.9
2015	37.2	40.4	41.7	42.6	40.3	37.1	34.9
2030	36.7	40.0	41.3	42.4	40.3	37.1	34.9
2045	36.2	39.5	40.9	42.2	40.4	37.1	34.9
2100	35.7	39.2	40.5	42.0	40.4	37.1	34.9
2115	35.2	38.7	40.2	41.7	40.4	37.1	34.9
2130	34.7	38.3	39.8	41.5	40.4	37.1	34.9
2145	34.2	37.9	39.5	41.3	40.4	37.1	34.9
2200	33.8	37.5	39.2	41.2	40.4	37.1	34.9
2215	33.3	37.2	38.9	41.0	40.4	37.1	34.9
2230	32.9	36.9	38.6	40.9	40.4	37.1	34.9
2245	32.7	36.4	38.2	40.8	40.3	37.2	34.9
2300	32.4	36.1	37.9	40.7	40.2	37.2	34.9
2315	32.0	35.8	37.6	40.6	40.2	37.2	34.9
2330	32.0	35.8	37.6	40.6	40.2	37.2	34.9
2345	31.5	35.3	37.1	39.7	40.1	37.2	34.9
2400	31.5	35.0	36.8	39.3	40.1	37.3	34.9

92/03/12  
14:05:52

13sep90.spf

1

13sep90.spf

1

THERMISTOR DATA SOIL PROFILE SADAM ENVIRONMENTAL AREA 13 SEP 1990											
TIME	0.0m	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm				
Hour	deg C	deg C	deg C	deg C	deg C	deg C	deg C				
0015	31.4	34.8	36.4	39.2	40.1	37.3	35.0	1415	58.6	51.4	47.6
0030	31.1	34.6	36.4	38.9	40.0	37.3	35.0	1430	58.3	51.6	47.9
0045	30.9	34.4	36.2	38.7	39.9	37.4	35.0	1445	58.0	51.6	48.1
0100	30.6	34.1	35.9	38.5	39.9	37.4	35.0	1500	57.6	51.5	48.2
0115	30.1	33.8	35.7	38.3	39.8	37.4	34.9	1515	56.3	51.5	48.4
0130	29.7	33.5	35.5	38.2	39.7	37.4	34.9	1530	55.1	51.2	48.4
0145	29.3	33.2	35.2	38.0	39.6	37.4	34.9	1545	54.2	50.8	48.3
0200	29.0	32.9	34.9	37.8	39.5	37.4	34.9	1600	53.3	50.3	48.3
0215	28.6	32.6	34.7	37.6	39.5	37.4	34.9	1615	52.2	49.8	47.9
0230	28.4	32.3	34.4	37.4	39.4	37.4	34.9	1630	50.9	49.3	47.7
0245	28.3	32.1	34.2	37.2	39.3	37.4	34.9	1645	49.9	48.6	47.3
0300	28.2	31.9	34.0	37.0	39.2	37.5	35.0	1700	48.9	48.1	47.0
0315	27.9	31.7	33.8	36.9	39.2	37.5	35.0	1715	47.8	47.5	46.7
0330	27.7	31.5	33.6	36.7	39.1	37.5	35.0	1730	46.5	46.8	46.3
0345	27.7	31.3	33.3	36.5	39.0	37.5	35.0	1745	45.0	46.1	45.9
0400	28.0	31.2	33.2	36.3	38.9	37.5	35.0	1800	43.7	45.3	45.4
0415	28.1	31.2	33.0	36.1	38.8	37.5	35.0	1815	42.4	44.7	45.0
0430	28.0	31.1	32.9	36.0	38.7	37.6	34.9	1830	41.0	43.8	44.5
0445	27.8	30.9	32.7	35.8	38.6	37.6	34.9	1845	39.7	43.0	43.9
0500	27.5	30.6	32.5	35.5	38.5	37.6	34.9	1900	38.6	42.2	43.9
0515	27.3	30.5	32.3	35.3	38.4	37.6	34.9	1915	38.0	41.6	43.2
0530	27.6	30.8	32.6	35.6	38.7	37.6	34.9	1930	37.3	41.0	42.8
0545	27.5	30.5	32.2	35.2	38.3	37.6	34.9	1945	36.7	40.3	41.8
0600	27.3	30.4	32.1	35.1	38.2	37.6	34.9	2000	36.2	39.8	41.6
0615	27.0	30.2	32.0	34.9	38.1	37.6	34.9	2015	35.8	39.4	41.0
0630	27.0	30.1	31.9	34.8	38.0	37.6	34.9	2030	35.3	39.0	40.6
0645	27.5	30.0	31.6	34.5	37.8	37.6	34.9	2045	34.8	38.5	40.2
0700	28.2	30.1	31.4	34.3	37.7	37.5	34.9	2100	34.4	38.1	39.6
0715	28.1	30.1	31.4	34.3	37.7	37.5	34.9	2115	34.0	37.7	39.4
0730	28.2	30.4	31.7	34.6	38.0	37.6	34.9	2130	33.6	37.3	39.1
0745	30.4	30.8	31.9	34.1	37.5	37.6	35.0	2145	33.2	37.0	38.8
0800	31.9	32.1	32.2	34.1	37.4	37.6	35.0	2200	32.8	36.6	38.5
0815	33.3	32.8	32.6	34.1	37.4	37.6	34.9	2215	32.4	36.2	38.1
0830	34.8	32.8	32.4	34.1	37.3	37.6	34.9	2230	32.1	35.9	37.8
0845	36.2	33.1	32.5	34.1	37.3	37.5	35.0	2245	31.7	35.5	37.5
0900	37.8	34.5	34.2	34.2	37.1	37.5	34.9	2300	31.5	35.2	37.2
0915	39.3	35.4	34.8	34.3	37.0	37.5	34.9	2315	31.4	35.0	36.9
0930	41.1	36.4	34.8	34.3	37.0	37.5	34.9	2330	31.2	34.8	36.7
0945	43.0	37.5	35.5	34.5	37.0	37.5	35.0	2345	31.0	34.5	36.5
1000	44.7	38.7	36.7	34.9	36.8	37.4	34.9	2400	30.6	34.3	36.2
1015	46.7	39.7	37.0	34.9	36.8	37.5	35.0				
1030	48.7	40.9	37.8	35.5	36.7	37.5	35.0				
1045	50.7	42.2	38.8	35.8	36.7	37.4	34.9				
1100	51.7	43.2	39.4	36.3	36.7	37.4	34.9				
1115	52.3	44.2	40.4	36.7	36.7	37.4	34.9				
1130	53.4	45.1	41.3	36.6	36.7	37.4	34.9				
1145	54.8	46.1	42.1	37.3	36.7	37.4	34.9				
1200	55.4	46.9	42.8	37.5	36.7	37.3	34.9				
1215	56.4	47.8	43.5	37.9	36.7	37.3	34.9				
1230	57.7	48.5	44.2	38.4	36.8	37.3	34.9				
1245	57.3	49.3	45.0	38.9	36.8	37.3	34.9				
1300	58.1	49.5	45.5	39.3	36.9	37.3	34.9				
1315	58.4	50.2	46.0	39.7	37.0	37.3	34.9				
1330	58.5	50.7	46.5	40.1	37.0	37.2	34.9				
1345	58.4	51.0	47.0	40.6	37.1	37.1	34.9				
1400	58.4	51.2	47.3	41.0	37.1	37.1	34.9				

1415	58.6	51.4	47.6	41.4	37.4	37.2	34.9
1430	58.3	51.6	47.9	41.6	37.5	37.2	34.9
1445	58.0	51.6	48.1	42.1	37.7	37.2	34.9
1500	57.6	51.5	48.2	42.4	37.7	37.1	34.9
1515	56.3	51.5	48.4	42.7	37.9	37.1	34.9
1530	55.1	51.2	48.4	43.0	38.0	37.1	34.9
1545	54.2	50.8	48.3	43.2	38.2	37.1	34.9
1600	53.3	50.3	48.3	43.4	38.3	37.1	34.9
1615	52.2	49.8	47.9	43.5	38.5	37.1	34.9
1630	50.9	49.3	47.7	43.7	38.6	37.1	34.9
1645	49.9	48.6	47.3	43.8	38.8	37.0	34.9
1700	48.9	48.1	47.0	43.8	38.9	37.0	34.9
1715	47.8	47.5	46.7	43.8	39.1	37.0	34.9
1730	46.5	46.8	46.3	43.8	39.2	37.0	34.9
1745	45.0	46.1	45.9	43.8	39.3	37.0	34.9
1800	43.7	45.3	45.4	43.7	39.4	37.0	34.9
1815	42.4	44.7	45.0	43.7	39.6	37.1	35.0
1830	41.0	43.8	44.5	43.6	39.7	37.1	35.0
1845	39.7	43.0	43.9	43.4	39.8	37.1	34.9
1900	38.6	42.2	43.3	43.2	39.8	37.0	34.9
1915	38.0	41.6	42.8	43.1	40.0	37.1	35.0
1930	37.3	41.0	42.3	42.8	40.0	37.1	35.0
1945	36.7	40.3	41.8	42.6	40.1	37.1	34.9
2000	36.2	39.8	41.6	42.4	40.1	37.1	34.9
2015	35.8	39.4	41.0	42.2	40.2	37.2	35.0
2030	35.3	39.0	40.6	42.0	40.3	37.1	35.0
2045	34.8	38.5	40.2	41.7	40.3	37.1	35.0
2100	34.4	38.1	39.6	41.5	40.3	37.1	35.0
2115	34.0	37.7	39.4	41.2	40.3	37.1	34.9
2130	33.6	37.3	39.1	41.0	40.2	37.1	34.9
2145	33.2	37.0	38.8	40.8	40.2	37.2	35.0
2200	32.8	36.6	38.5	40.6	40.3	37.2	35.0
2215	32.4	36.2	38.1	40.3	40.2	37.2	35.0
2230	32.1	35.9	37.8	40.1	40.2	37.2	35.0
2245	31.7	35.5	37.5	39.9	40.1	37.2	35.0
2300	31.5	35.2	37.2	39.6	40.1	37.2	35.0
2315	31.4	35.0	36.9	39.4	40.0	37.2	35.0
2330	31.2	34.8	36.7	39.3	40.0	37.1	35.0
2345	31.0	34.5	36.5	39.0	40.0	37.3	35.0
2400	30.6	34.3	36.2	38.8	39.9	37.3	35.0

22/03/12  
14:06:01

14sep90.spf

1

THEMISTOR DATA  
SOIL PROFILE  
SAGARM ENVIRONMENTAL AREA  
14 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
Hum	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	30.2	34.0	36.0	38.6	39.8	37.3	35.0
0030	29.8	33.7	35.7	38.4	39.6	37.3	35.0
0045	29.5	33.4	35.4	38.2	39.7	37.3	35.0
0100	29.2	33.1	35.2	38.0	39.6	37.3	35.0
0115	29.0	32.8	34.9	37.8	39.5	37.3	35.0
0130	28.8	32.6	34.7	37.6	39.4	37.4	35.0
0145	28.6	32.4	34.5	37.4	39.3	37.4	35.0
0200	28.3	32.2	34.3	37.3	39.3	37.5	35.0
0215	27.9	31.9	34.0	37.1	39.2	37.5	35.0
0230	28.0	31.7	33.8	36.9	39.2	37.5	35.0
0245	28.1	31.5	33.6	36.7	39.1	37.5	35.0
0300	28.1	31.4	33.4	36.5	39.0	37.5	35.0
0315	28.1	31.4	33.3	36.3	38.9	37.5	35.0
0330	28.3	31.4	33.2	36.2	38.8	37.5	35.0
0345	28.6	31.3	33.0	36.0	38.7	37.5	35.0
0400	28.6	31.2	32.9	35.9	38.6	37.5	35.0
0415	28.7	31.1	32.9	35.7	38.5	37.5	35.0
0430	28.6	31.1	32.8	35.6	38.5	37.5	35.0
0445	28.4	31.0	32.7	35.5	38.4	37.5	35.0
0500	27.8	31.0	32.7	35.3	38.3	37.5	35.0
0515	27.4	30.8	32.5	35.2	38.3	37.5	35.0
0530	27.1	30.5	32.3	35.1	38.1	37.5	35.0
0545	27.3	30.3	32.2	35.0	38.0	37.5	35.0
0600	27.4	30.3	32.0	34.8	37.9	37.5	35.0
0615	27.4	30.2	31.9	34.7	37.8	37.5	35.0
0630	27.5	30.1	31.8	34.6	37.8	37.5	35.0
0645	27.7	30.1	31.7	34.5	37.7	37.5	35.0
0700	28.3	30.2	31.6	34.4	37.6	37.5	35.0
0715	28.1	30.2	31.7	34.3	37.5	37.5	35.0
0730	28.9	30.7	32.0	34.8	37.9	37.5	35.0
0745	32.1	31.2	31.9	34.1	37.4	37.5	35.0
0800	32.1	32.2	32.3	34.0	37.3	37.5	35.0
0815	36.5	33.3	32.8	34.0	37.2	37.5	35.0
0830	37.1	34.3	33.4	34.0	37.1	37.5	35.0
0845	38.4	35.1	34.0	34.1	37.0	37.5	35.0
0900	40.1	36.0	34.5	34.2	37.0	37.5	35.0
0915	41.6	37.0	35.2	34.4	36.9	37.5	35.0
0930	41.3	37.0	35.9	34.6	36.9	37.5	35.0
0945	44.8	39.0	36.4	34.8	36.8	37.5	35.0
1000	46.1	39.9	37.3	35.0	36.7	37.4	35.0
1015	47.4	40.9	38.0	35.3	36.7	37.4	35.0
1030	48.9	41.9	38.8	35.3	36.7	37.4	35.0
1045	50.1	42.9	39.4	35.9	36.7	37.4	35.0
1100	51.7	43.8	40.3	36.2	36.6	37.3	35.0
1115	53.1	44.8	41.1	36.6	36.6	37.3	35.0
1130	51.1	44.8	41.9	37.0	36.7	37.3	35.0
1145	54.2	46.4	42.4	37.4	36.7	37.3	35.0
1200	56.5	47.1	43.1	37.8	36.7	37.3	35.0
1215	55.3	47.7	43.8	38.2	36.7	37.2	34.9
1230	55.5	48.3	44.4	38.6	36.7	37.2	34.9
1245	56.7	48.8	44.9	39.0	36.8	37.2	35.0
1300	57.2	49.4	45.5	39.5	36.9	37.2	35.0
1315	57.9	50.0	46.0	39.9	37.0	37.2	35.0
1330	57.0	50.1	46.5	40.3	37.1	37.2	35.0
1345	58.8	50.4	46.8	40.7	37.2	37.2	35.0
1400	58.6	50.4	47.0	41.0	37.2	37.2	34.9

1415	56.5	50.5	47.2	41.3	37.4	37.1	34.9
1430	56.5	50.7	47.4	41.3	37.4	37.1	34.9
1445	56.0	50.7	47.5	41.9	37.6	37.1	35.0
1500	55.8	50.7	47.7	42.2	37.8	37.1	35.0
1515	55.2	50.6	47.7	42.5	37.9	37.1	35.0
1530	54.5	50.3	47.8	42.7	38.0	37.1	35.0
1545	53.9	50.1	47.7	42.9	38.2	37.1	35.0
1600	52.7	49.8	47.6	43.1	38.3	37.1	35.0
1615	52.0	49.3	47.5	43.2	38.5	37.1	35.0
1630	52.0	48.9	47.3	43.3	38.5	37.1	35.0
1645	49.3	48.3	47.0	43.4	38.8	37.1	35.0
1700	48.0	47.7	46.7	43.5	38.9	37.0	35.0
1715	46.7	47.0	46.3	43.5	39.0	37.0	35.0
1730	45.4	46.3	45.9	43.5	39.1	37.0	35.0
1745	44.0	45.5	45.4	43.4	39.2	37.0	35.0
1800	42.5	44.7	44.9	43.4	39.3	37.0	35.0
1815	41.2	43.9	44.4	43.2	39.4	37.0	35.0
1830	39.8	43.1	43.9	43.2	39.5	37.0	35.0
1845	38.7	42.3	43.4	43.0	39.7	37.0	35.0
1900	37.7	41.5	42.8	42.6	39.7	37.0	35.0
1915	37.1	40.8	42.2	42.6	39.8	37.0	35.0
1930	36.7	40.2	41.7	42.4	39.9	37.1	35.0
1945	36.2	39.8	41.3	42.0	40.0	37.1	35.0
2000	35.6	39.3	40.9	42.0	40.0	37.1	35.0
2015	35.1	38.8	40.5	41.7	40.0	37.1	35.0
2030	34.5	38.3	40.0	41.5	40.0	37.1	35.0
2045	34.0	37.9	39.7	41.3	40.0	37.1	35.0
2100	33.6	37.5	39.3	41.1	40.1	37.1	35.0
2115	33.0	37.1	39.0	40.8	40.1	37.1	35.0
2130	32.6	36.6	38.6	40.6	40.1	37.1	35.0
2145	32.0	36.2	38.2	40.3	40.0	37.1	35.0
2200	31.7	35.8	37.8	40.1	40.0	37.2	35.0
2215	31.6	35.4	37.5	39.9	39.9	37.2	35.0
2230	31.5	35.2	37.2	39.7	40.0	37.2	35.0
2245	31.2	35.0	37.0	39.5	39.9	37.2	35.1
2300	31.0	34.7	36.7	39.3	39.9	37.2	35.1
2315	30.7	34.4	36.4	39.0	39.8	37.2	35.1
2330	30.4	34.2	36.2	38.8	39.8	37.2	35.1
2345	30.0	33.8	35.9	38.6	39.7	37.2	35.1
2400	29.6	33.5	35.6	38.4	39.6	37.2	35.0

92/03/12  
14:06:08

1

15sep90.spf

TEGEMISTON DATA  
SOIL PROFILE  
SAGARM ENVIRONMENTAL AREA  
15 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hr:min	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	29.4	32.2	35.3	38.2	35.5	37.2	35.0
0030	29.1	33.0	35.1	38.0	35.5	37.2	35.0
0045	28.9	32.7	34.8	37.8	35.4	37.2	35.0
0100	28.6	32.5	34.5	37.5	35.3	37.3	35.0
0115	28.7	32.3	34.5	37.4	35.3	37.4	35.1
0130	28.8	32.2	34.2	37.2	35.2	37.4	35.1
0145	28.9	32.1	34.1	37.0	35.2	37.4	35.1
0200	29.5	32.0	33.9	36.9	35.1	37.4	35.1
0215	29.4	32.1	33.8	36.7	35.0	37.4	35.1
0230	29.3	32.1	33.8	36.5	34.9	37.4	35.1
0245	29.0	32.0	33.7	36.4	34.8	37.4	35.1
0300	28.6	31.8	33.5	36.2	34.7	37.4	35.1
0315	28.4	31.5	33.4	36.1	34.7	37.4	35.1
0330	28.2	31.4	33.2	36.0	34.6	37.4	35.1
0345	27.9	31.2	33.0	35.8	34.5	37.4	35.1
0400	27.8	31.0	32.8	35.7	34.4	37.4	35.1
0415	27.7	30.8	32.7	35.5	34.3	37.4	35.0
0430	27.5	30.7	32.5	35.4	34.2	37.4	35.0
0445	27.4	30.5	32.4	35.2	34.1	37.4	35.0
0500	27.2	30.4	32.2	35.1	34.0	37.4	35.0
0515	27.1	30.2	32.1	35.0	33.9	37.4	35.0
0530	27.3	30.1	31.9	34.8	33.7	37.4	35.0
0545	27.4	30.1	31.8	34.7	33.6	37.4	35.0
0600	27.5	30.0	31.7	34.5	33.5	37.4	35.0
0615	27.5	30.0	31.6	34.5	33.4	37.4	35.0
0630	27.6	30.0	31.6	34.5	33.4	37.4	35.0
0645	27.5	30.0	31.5	34.2	33.3	37.4	35.0
0700	27.6	29.9	31.5	34.1	33.2	37.4	35.0
0715	27.9	29.9	31.4	34.0	33.1	37.4	35.0
0730	28.5	30.0	31.4	33.9	33.0	37.4	35.0
0745	29.4	30.2	31.4	33.8	32.9	37.4	35.0
0800	29.7	30.5	31.5	33.7	32.8	37.4	35.0
0815	29.8	30.8	31.6	33.7	32.7	37.4	35.0
0830	30.1	30.9	31.7	33.7	32.7	37.4	35.0
0845	32.3	31.2	31.8	33.7	32.7	37.4	35.0
0900	36.3	32.4	32.2	33.6	32.6	37.4	35.0
0915	35.4	32.5	32.0	33.7	32.7	37.4	35.1
0930	35.2	32.7	32.2	33.7	32.7	37.4	35.0
0945	35.7	33.9	33.5	33.7	32.6	37.4	35.0
1000	36.5	34.3	33.8	33.8	32.5	37.3	35.0
1015	37.4	34.7	34.1	34.0	32.4	37.3	35.0
1030	38.4	35.3	34.4	34.1	32.4	37.3	35.1
1045	39.1	35.8	34.8	34.2	32.4	37.3	35.1
1100	39.6	36.4	35.2	34.3	32.3	37.3	35.1
1115	41.0	36.9	35.5	34.5	32.2	37.3	35.0
1130	41.0	37.4	35.9	34.6	32.2	37.2	35.0
1145	40.5	37.7	36.3	34.8	32.2	37.2	35.0
1200	40.2	37.7	36.5	35.0	32.2	37.2	35.0
1215	40.0	37.7	36.7	35.1	32.1	37.2	35.0
1230	39.4	37.7	36.8	35.3	32.1	37.2	35.0
1245	38.8	37.5	36.9	35.5	32.1	37.2	35.0
1300	38.2	37.4	36.8	35.6	32.1	37.2	35.0
1315	37.6	37.1	36.8	35.7	32.1	37.2	35.0
1330	37.4	36.9	36.7	35.9	32.1	37.2	35.0
1345	36.2	36.4	36.4	35.8	32.1	37.1	35.0
1400	43.8	37.2	36.7	35.9	32.1	37.1	35.0

1415	44.4	38.3	37.0	36.0	36.3	37.1	35.1
1430	44.4	38.5	37.5	36.0	36.3	37.1	35.0
1445	43.1	38.9	38.1	36.1	36.3	37.0	35.0
1500	42.5	39.4	38.5	36.1	36.3	37.0	35.0
1515	42.6	39.4	38.5	36.4	36.3	37.0	35.0
1530	42.3	39.4	38.4	36.4	36.4	37.0	35.0
1545	42.4	40.0	38.7	36.7	36.4	37.0	35.0
1600	48.9	43.2	39.1	36.9	36.4	37.0	35.0
1615	48.8	43.2	38.7	37.0	36.4	37.0	35.0
1630	47.5	42.8	40.1	37.2	36.5	37.0	35.0
1645	47.5	42.7	40.7	37.4	36.5	37.0	35.0
1700	44.7	42.4	40.8	37.4	36.5	37.0	35.0
1715	43.1	41.9	40.7	37.8	36.6	37.0	35.0
1730	43.1	41.9	40.7	37.8	36.6	37.0	35.0
1745	40.8	41.2	40.5	38.0	36.6	36.9	35.0
1800	39.3	40.2	40.0	38.2	36.7	36.9	35.0
1815	37.9	39.5	39.5	38.2	36.8	36.9	35.0
1830	36.6	38.6	39.2	38.2	36.9	36.8	35.0
1845	35.4	37.4	38.3	38.2	37.0	36.8	35.0
1900	34.5	36.4	37.9	38.1	37.0	36.8	35.0
1915	33.8	36.3	37.5	38.0	37.0	36.8	35.0
1930	32.7	35.8	37.1	37.8	37.1	36.8	35.0
1945	32.3	35.4	36.8	37.7	37.1	36.8	35.0
2000	32.3	35.4	36.8	37.7	37.1	36.8	35.0
2015	31.9	35.0	36.4	37.6	37.2	36.8	35.1
2030	31.4	34.6	36.1	37.4	37.2	36.8	35.1
2045	31.4	34.3	35.8	37.3	37.2	36.8	35.0
2100	31.3	34.1	35.5	37.1	37.2	36.7	35.0
2115	31.1	33.6	35.3	36.9	37.2	36.7	35.0
2130	30.9	33.6	35.1	36.8	37.2	36.7	35.0
2145	30.6	33.5	34.9	36.7	37.2	36.6	35.0
2200	30.4	33.2	34.7	36.5	37.2	36.6	35.1
2215	30.1	33.0	34.5	36.4	37.2	36.6	35.1
2230	30.0	32.8	34.3	36.3	37.2	36.7	35.1
2245	29.8	32.6	34.1	36.1	37.2	36.7	35.1
2300	29.6	32.4	33.9	35.9	37.2	36.7	35.1
2315	29.4	32.2	33.7	35.8	37.1	36.7	35.1
2330	29.3	32.0	33.5	35.6	37.1	36.7	35.0
2345	29.2	31.9	33.3	35.5	37.0	36.7	35.0
2400	29.0	31.7	33.2	35.3	37.0	36.7	35.0

72/03/12  
14-06-19

1

16sep90.spf

THERMISTOR DATA SOIL PROFILE GADJAH ENVIRONMENTAL AREA 16 SEP 1990									
TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm		
hhmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c		
0015	28.7	31.5	33.0	35.2	36.9	36.7	35.0		
0030	28.4	31.4	32.9	35.1	36.9	36.8	35.0		
0045	28.1	31.1	32.6	34.8	36.9	36.7	35.0		
0100	27.9	30.9	32.4	34.6	36.9	36.7	35.0		
0115	27.6	30.7	32.2	34.4	36.8	36.7	35.0		
0130	27.6	30.5	32.2	34.6	36.7	36.7	35.0		
0145	27.5	30.4	32.0	34.5	36.7	36.7	35.0		
0200	27.3	30.2	31.9	34.3	36.6	36.7	35.0		
0215	27.1	30.1	31.7	34.2	36.6	36.7	35.0		
0230	26.9	29.9	31.6	34.1	36.5	36.7	35.0		
0245	26.7	29.7	31.4	34.0	36.5	36.7	35.0		
0300	26.4	29.5	31.2	33.8	36.4	36.7	35.0		
0315	26.3	29.3	31.1	33.7	36.3	36.7	35.0		
0330	25.9	29.2	30.9	33.6	36.3	36.7	35.0		
0345	25.4	28.9	30.7	33.5	36.2	36.7	35.0		
0400	25.1	28.7	30.6	33.4	36.2	36.7	35.0		
0415	24.9	28.4	30.4	33.2	36.1	36.7	35.0		
0430	24.7	28.2	30.2	33.1	36.1	36.7	35.0		
0445	24.6	28.0	30.0	33.0	36.0	36.7	35.0		
0500	24.6	27.9	29.8	32.8	35.9	36.7	35.0		
0515	24.5	27.8	29.7	32.7	35.8	36.7	35.0		
0530	24.5	27.6	29.5	32.5	35.8	36.7	35.0		
0545	24.4	27.5	29.4	32.4	35.7	36.7	35.0		
0600	24.5	27.5	29.3	32.3	35.6	36.7	35.0		
0615	24.5	27.4	29.2	32.2	35.6	36.7	35.0		
0630	24.6	27.3	29.1	32.0	35.5	36.7	35.0		
0645	24.7	27.3	29.0	31.9	35.4	36.6	35.0		
0700	25.1	27.3	28.9	31.8	35.3	36.6	35.0		
0715	25.6	27.5	28.9	31.7	35.3	36.6	35.0		
0730	26.7	27.7	29.0	31.6	35.2	36.6	35.0		
0745	27.9	28.2	29.1	31.4	35.2	36.6	35.0		
0800	29.3	28.8	29.3	31.5	35.1	36.6	35.0		
0815	30.8	29.5	29.7	31.3	35.0	36.6	35.0		
0830	32.4	30.3	31.1	31.3	35.0	36.6	35.0		
0845	34.2	31.2	31.6	31.3	34.9	36.6	35.0		
0900	36.2	32.2	31.1	31.3	34.8	36.5	35.0		
0915	38.2	33.4	31.9	31.4	34.7	36.5	35.0		
0930	40.1	34.6	31.6	31.6	34.7	36.5	35.0		
0945	42.0	35.8	31.6	31.6	34.6	36.5	35.0		
1000	43.1	37.0	31.3	31.5	34.6	36.5	35.0		
1015	45.0	38.0	31.2	31.2	34.5	36.4	35.0		
1030	47.1	39.3	31.0	31.0	34.3	36.4	35.0		
1045	48.5	40.5	31.0	31.0	34.3	36.4	35.0		
1100	49.8	41.5	31.0	31.0	34.4	36.4	35.0		
1115	50.9	42.4	31.0	31.0	34.4	36.4	35.0		
1130	51.8	43.5	31.0	31.0	34.3	36.3	35.0		
1145	52.8	44.5	40.2	35.2	34.3	36.3	35.0		
1200	52.3	45.0	40.9	35.7	34.3	36.3	35.0		
1215	51.3	45.5	41.5	35.7	34.3	36.3	35.0		
1230	54.1	46.1	42.1	36.1	34.6	36.3	35.0		
1245	55.4	46.8	42.7	36.5	34.7	36.3	35.0		
1300	56.1	47.5	43.2	37.0	34.9	36.3	35.0		
1315	56.0	48.0	43.6	37.4	34.9	36.3	35.0		
1330	56.4	48.5	44.0	37.8	34.9	36.3	35.0		
1345	56.4	48.7	44.8	38.2	35.0	36.3	35.0		
1400	56.1	49.0	45.2	38.6	35.1	36.3	35.0		

1415	55.4	49.0	45.4	39.0	35.3	36.1	35.0
1430	55.6	49.1	45.6	39.3	35.4	36.1	35.0
1445	54.5	48.1	45.6	39.6	35.5	36.1	34.9
1500	53.5	48.9	45.8	39.9	35.6	36.1	34.9
1515	53.1	48.7	45.9	40.2	35.8	36.1	34.9
1530	53.1	48.4	45.9	40.5	35.9	36.1	34.9
1545	52.0	48.3	45.8	40.7	36.0	36.1	34.9
1600	51.2	47.9	45.8	40.9	36.2	36.0	34.9
1615	50.3	47.6	45.6	41.1	36.4	36.0	34.9
1630	48.2	47.0	45.4	41.2	36.5	36.0	34.9
1645	46.9	46.3	45.1	41.3	36.7	36.0	34.9
1700	45.6	45.5	44.7	41.3	36.8	36.0	34.9
1715	44.3	44.8	44.3	41.3	36.9	36.0	34.9
1730	43.2	44.1	43.8	41.3	37.1	36.0	34.9
1745	41.8	43.3	43.4	41.3	37.2	35.9	34.9
1800	40.4	42.6	42.9	41.2	37.3	35.9	34.9
1815	39.0	41.8	42.4	41.2	37.5	36.0	34.9
1830	37.7	41.0	41.9	41.1	37.6	36.0	34.9
1845	36.6	40.1	41.3	40.9	37.7	36.0	34.9
1900	35.9	39.4	40.7	40.7	37.7	36.0	34.9
1915	35.5	38.8	40.2	40.6	37.8	36.0	34.9
1930	35.2	38.3	39.7	40.4	37.9	36.0	34.9
1945	34.7	37.9	39.3	40.2	38.0	36.0	34.9
2000	34.2	37.4	38.9	39.9	38.0	36.0	34.9
2015	33.8	37.0	38.5	39.7	38.0	36.0	34.9
2030	33.4	36.7	38.2	39.5	38.1	36.0	35.0
2045	32.9	36.3	37.9	39.3	38.2	36.1	34.9
2100	32.3	35.9	37.5	39.1	38.2	36.1	34.9
2115	32.0	35.5	37.2	38.9	38.1	36.1	34.9
2130	31.6	35.1	36.9	38.7	38.1	36.1	34.9
2145	31.5	34.8	36.5	38.5	38.1	36.1	34.9
2200	31.0	34.5	36.2	38.2	38.1	36.1	34.9
2215	30.7	34.2	36.0	38.1	38.1	36.1	35.0
2230	30.3	33.9	35.7	37.9	38.1	36.1	34.9
2245	30.0	33.6	35.4	37.7	38.0	36.1	34.9
2300	29.7	33.3	35.2	37.5	38.0	36.1	34.9
2315	29.3	33.0	34.9	37.3	38.0	36.1	34.9
2330	29.0	32.7	34.6	37.1	37.9	36.1	34.9
2345	28.7	32.6	34.3	36.9	37.8	36.1	34.9
2400	28.5	32.1	34.1	36.7	37.8	36.1	34.9

920312  
14:06:26

1  
THERMISTOR DATA  
SOIL PROFILE  
SANDHILL ENVIRONMENTAL AREA  
17 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-10.0cm	-10.0cm	-70.0cm
hr:min	deg C	deg C	deg C	deg C	deg C	deg C	deg C
0015	28.1	31.9	31.9	36.5	37.8	36.2	34.9
0030	28.1	31.7	31.6	36.4	37.8	36.2	34.9
0045	27.9	31.4	31.4	36.2	37.7	36.2	34.9
0100	28.0	31.2	31.2	36.0	37.6	36.2	34.9
0115	28.0	31.1	31.0	35.8	37.5	36.3	34.9
0130	27.8	31.0	30.8	35.6	37.5	36.3	34.9
0145	27.4	30.8	30.7	35.4	37.4	36.3	34.9
0200	27.4	30.7	30.5	35.3	37.3	36.3	34.9
0215	27.3	30.5	30.3	35.1	37.2	36.3	34.9
0230	27.2	30.4	30.2	35.0	37.2	36.3	34.9
0245	26.9	30.2	30.0	34.8	37.1	36.3	34.8
0300	26.6	30.0	29.9	34.7	37.0	36.3	34.8
0315	26.7	29.9	29.7	34.5	36.9	36.3	34.8
0330	26.7	29.8	29.6	34.3	36.8	36.3	34.8
0345	26.4	29.6	29.4	34.1	36.7	36.4	34.8
0400	26.9	29.6	29.4	34.1	36.7	36.4	34.8
0415	27.0	29.5	29.3	34.0	36.7	36.4	34.8
0430	27.1	29.5	29.4	34.0	36.6	36.4	34.8
0445	27.3	29.4	29.3	33.8	36.5	36.4	34.8
0500	27.3	29.4	29.3	33.6	36.5	36.4	34.8
0515	27.3	29.3	29.1	33.5	36.4	36.4	34.8
0530	27.1	29.3	29.1	33.3	36.3	36.4	34.8
0545	27.1	29.3	29.0	33.3	36.2	36.4	34.8
0600	26.9	29.4	29.4	33.0	36.2	36.4	34.8
0615	26.4	29.2	29.2	32.7	36.1	36.4	34.8
0630	26.1	29.0	29.0	32.4	36.0	36.4	34.8
0645	26.0	28.8	28.8	32.3	35.9	36.4	34.8
0700	26.6	28.8	28.8	32.3	35.8	36.4	34.8
0715	26.9	28.9	29.0	32.4	35.8	36.4	34.8
0730	27.6	29.0	29.0	32.5	35.7	36.4	34.8
0745	28.5	29.3	29.3	32.6	35.7	36.4	34.8
0800	28.9	29.7	29.7	32.7	35.7	36.4	34.8
0815	29.4	29.9	29.9	32.8	35.6	36.4	34.8
0830	30.2	30.2	30.2	32.9	35.6	36.4	34.8
0845	31.5	30.6	30.6	32.9	35.5	36.3	34.8
0900	32.7	31.2	31.2	32.9	35.3	36.3	34.8
0915	35.4	32.0	31.6	32.4	35.2	36.3	34.8
0930	37.2	33.4	32.2	32.5	35.2	36.3	34.8
0945	36.7	34.1	32.8	32.6	35.1	36.3	34.8
1000	37.6	34.5	33.3	32.7	35.1	36.2	34.8
1015	38.4	35.0	33.7	32.8	35.0	36.2	34.8
1030	39.9	35.6	34.1	33.0	35.0	36.2	34.8
1045	45.3	36.7	34.6	33.2	34.9	36.2	34.8
1100	49.9	39.2	35.7	33.4	34.9	36.2	34.8
1115	51.1	41.3	37.0	33.6	34.9	36.2	34.8
1130	51.8	42.6	38.2	33.9	34.8	36.2	34.8
1145	51.7	43.6	39.3	34.3	34.8	36.2	34.8
1200	52.3	44.4	40.2	34.8	34.8	36.1	34.8
1215	53.7	45.1	41.0	35.3	34.8	36.1	34.8
1230	53.2	45.9	41.7	35.7	34.9	36.1	34.8
1245	49.3	45.5	42.2	36.2	34.9	36.1	34.8
1300	51.5	44.9	42.2	36.6	35.0	36.1	34.8
1315	51.6	45.6	42.3	37.0	35.0	36.1	34.8
1330	55.3	46.8	42.9	37.3	35.0	36.1	34.8
1345	56.3	47.7	43.6	37.7	35.2	36.1	34.8
1400	57.1	48.5	44.3	38.0	35.2	36.1	34.8

17sep90.spf

1415	57.2	49.1	44.8	39.4	35.3	36.0	34.8
1430	55.5	45.3	45.3	39.6	35.4	36.0	34.8
1445	53.1	48.8	45.6	39.2	35.5	36.0	34.8
1500	52.7	48.3	45.5	39.5	35.6	36.0	34.8
1515	54.0	48.2	45.4	39.4	35.8	35.9	34.8
1530	53.0	48.4	45.5	40.1	35.9	35.9	34.8
1545	52.3	48.0	45.4	40.3	36.0	35.9	34.8
1600	52.9	48.0	45.5	40.6	36.2	35.9	34.8
1615	51.8	48.0	45.4	40.8	36.3	35.9	34.8
1630	51.3	47.7	45.5	40.9	36.4	35.9	34.7
1645	49.7	47.2	45.4	41.0	36.5	35.8	34.7
1700	47.3	46.4	45.1	41.1	36.7	35.8	34.7
1715	45.8	45.7	44.9	41.3	36.8	35.9	34.8
1730	44.2	45.0	44.4	41.3	37.0	35.9	34.8
1745	42.1	44.0	43.9	41.3	37.1	35.9	34.8
1800	41.3	43.1	43.3	41.3	37.2	35.8	34.8
1815	39.8	42.3	42.8	41.2	37.3	35.8	34.8
1830	38.4	41.5	42.2	41.1	37.4	35.9	34.7
1845	37.4	40.7	41.7	41.0	37.6	35.9	34.8
1900	36.5	39.9	41.1	40.9	37.6	35.8	34.8
1915	35.9	39.3	40.6	40.7	37.7	35.8	34.7
1930	35.3	38.7	40.2	40.5	37.8	35.8	34.6
1945	34.9	38.2	39.7	40.3	37.9	35.8	34.6
2000	34.7	37.7	39.2	40.1	38.0	35.8	34.6
2015	33.7	37.2	38.6	39.6	38.0	35.8	34.6
2030	33.3	36.8	38.4	39.5	38.0	35.8	34.6
2045	32.8	36.4	38.1	39.5	38.1	35.8	34.6
2100	32.5	36.4	37.9	39.3	38.1	35.8	34.6
2115	32.4	35.8	37.1	39.0	38.1	35.9	34.8
2130	32.3	35.5	37.1	38.6	38.1	35.9	34.8
2145	31.8	35.1	36.6	38.3	38.1	35.9	34.8
2200	31.3	34.8	36.3	38.3	38.1	36.0	34.8
2215	31.0	34.5	36.3	38.3	38.1	36.0	34.8
2230	30.4	34.1	36.0	38.0	38.1	36.0	34.8
2245	30.0	33.7	35.7	37.8	38.0	36.0	34.8
2300	29.7	33.4	35.3	37.4	38.0	36.0	34.8
2315	29.4	33.1	35.0	37.4	38.0	36.0	34.8
2330	29.1	32.8	34.8	37.2	37.9	36.0	34.8
2345	28.8	32.5	34.5	37.0	37.8	36.0	34.7
2400	28.5	32.2	34.2	36.8	37.8	36.1	34.7

92/03/12  
14:06:42

TEHERMISTOR DATA  
SOIL PROFILE  
SADARK ENVIRONMENTAL AREA  
18 SEP 1990

TIME	0.0cm	-7.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg C	deg C	deg C	deg C	deg C	deg C	deg C
0015	28.3	32.0	14.0	36.7	37.8	36.1	34.8
0310	28.0	31.7	31.8	34.5	37.8	36.1	34.8
0345	27.5	31.4	32.5	34.2	37.7	36.1	34.8
0400	27.4	31.1	32.2	34.1	37.6	36.1	34.8
0415	27.0	30.8	33.0	35.9	37.6	36.1	34.8
0430	26.4	30.5	32.7	35.7	37.5	36.1	34.8
0445	26.0	30.1	32.5	35.5	37.4	36.1	34.8
0500	25.8	29.8	32.2	35.3	37.3	36.1	34.8
0515	25.6	29.5	31.9	35.1	37.3	36.1	34.8
0530	25.5	29.3	31.6	35.0	37.2	36.1	34.7
0545	25.4	29.1	31.4	34.8	37.1	36.1	34.7
0600	25.3	28.9	31.2	34.6	37.0	36.1	34.7
0615	25.1	28.7	31.0	34.4	37.0	36.2	34.7
0630	25.0	28.6	30.8	34.2	37.0	36.3	34.8
0645	24.8	28.4	30.6	34.1	36.9	36.3	34.8
0700	24.0	28.1	30.4	33.9	36.7	36.3	34.8
0715	23.4	27.8	30.2	33.7	36.7	36.3	34.8
0730	23.2	27.4	29.9	33.5	36.5	36.2	34.7
0745	22.8	27.1	29.7	33.3	36.5	36.2	34.7
0800	22.6	26.9	29.4	33.2	36.4	36.2	34.6
0815	22.3	26.6	29.2	33.0	36.4	36.2	34.6
0830	21.9	26.4	29.0	32.8	36.3	36.3	34.8
0845	21.5	26.1	28.7	32.7	36.2	36.3	34.8
0900	21.2	25.8	28.5	32.5	36.1	36.3	34.8
0915	20.9	25.5	28.2	32.3	36.0	36.3	34.8
0930	20.7	25.2	27.9	32.1	35.9	36.3	34.7
0945	20.8	25.0	27.7	31.9	35.8	36.3	34.7
1000	21.2	24.9	27.4	31.7	35.7	36.2	34.7
1015	21.6	24.9	27.4	31.5	35.6	36.2	34.7
1030	22.2	25.2	27.3	31.4	35.5	36.2	34.7
1045	24.6	25.6	27.4	31.2	35.4	36.2	34.7
1100	25.0	26.3	27.6	31.1	35.3	36.2	34.7
1115	27.0	26.8	27.9	31.0	35.2	36.2	34.7
1130	28.2	27.9	28.2	30.9	35.1	36.2	34.7
1145	29.1	28.9	28.9	30.9	35.0	36.2	34.8
1200	34.6	30.5	29.6	30.9	35.0	36.3	34.8
1215	36.7	31.8	30.4	31.0	34.8	36.2	34.7
1230	38.9	33.2	31.3	31.1	34.7	36.2	34.7
1245	40.6	34.6	32.2	31.3	34.7	36.2	34.7
1300	42.0	35.8	33.1	31.5	34.6	36.1	34.7
1315	43.5	36.9	34.0	31.8	34.5	36.2	34.7
1330	45.4	38.1	34.8	32.1	34.5	36.2	34.7
1345	47.0	39.3	35.7	32.4	34.4	36.1	34.7
1400	48.2	40.3	36.6	32.8	34.4	36.1	34.7
1415	49.5	41.4	37.5	33.2	34.4	36.1	34.7
1430	51.0	42.4	38.3	33.6	34.3	36.1	34.7
1445	51.9	43.4	39.1	34.0	34.3	36.1	34.7
1455	53.0	44.4	40.0	34.4	34.3	36.1	34.7
1500	53.5	45.2	40.8	34.9	34.4	36.1	34.7
1515	54.1	45.9	41.5	35.3	34.4	36.0	34.6
1530	54.3	46.4	42.1	35.8	34.4	36.0	34.6
1545	54.4	46.9	42.6	36.2	34.5	36.0	34.7
1555	54.5	47.2	43.1	36.7	34.5	36.0	34.7
1600	54.7	47.6	43.5	37.1	34.6	36.0	34.7
1615	54.4	47.8	43.9	37.5	34.7	36.0	34.7
1630	54.6	48.0	44.2	37.9	34.8	35.9	34.7

18sep90.spf

1.

1415	54.9	48.3	44.5	38.2	34.9	35.9	34.7
1430	54.2	48.4	44.8	38.5	35.0	35.8	34.6
1445	53.7	48.4	45.0	38.9	35.1	35.8	34.6
1455	52.9	48.3	45.2	39.2	35.3	35.8	34.6
1500	52.5	48.3	45.3	39.5	35.4	35.8	34.6
1515	52.2	48.0	45.3	39.8	35.5	35.8	34.6
1530	51.2	47.5	45.2	40.0	35.7	35.8	34.6
1545	50.4	47.5	45.0	40.2	35.8	35.8	34.6
1600	48.9	46.5	44.7	40.3	36.0	35.8	34.7
1615	47.5	46.3	44.6	40.5	36.1	35.8	34.7
1630	46.2	45.5	44.6	40.5	36.2	35.8	34.7
1645	45.0	44.9	44.6	40.6	36.4	35.8	34.7
1700	44.1	44.1	44.6	40.6	36.4	35.8	34.7
1715	43.2	43.2	44.6	40.6	36.4	35.8	34.7
1730	42.4	42.4	44.6	40.6	36.4	35.8	34.7
1745	41.4	41.4	44.6	40.5	36.4	35.8	34.7
1800	40.4	40.4	44.6	40.5	36.4	35.8	34.7
1815	39.4	39.4	44.6	40.5	36.4	35.8	34.7
1830	38.4	38.4	44.6	40.5	36.4	35.8	34.7
1845	37.4	37.4	44.6	40.5	36.4	35.8	34.7
1900	36.4	36.4	44.6	40.5	36.4	35.8	34.7
1915	35.4	35.4	44.6	40.5	36.4	35.8	34.7
1930	34.4	34.4	44.6	40.5	36.4	35.8	34.7
1945	33.4	33.4	44.6	40.5	36.4	35.8	34.7
2000	32.4	32.4	44.6	40.5	36.4	35.8	34.7
2015	31.4	31.4	44.6	40.5	36.4	35.8	34.7
2030	30.4	30.4	44.6	40.5	36.4	35.8	34.7
2045	29.4	29.4	44.6	40.5	36.4	35.8	34.7
2100	28.4	28.4	44.6	40.5	36.4	35.8	34.7
2115	27.4	27.4	44.6	40.5	36.4	35.8	34.7
2130	26.4	26.4	44.6	40.5	36.4	35.8	34.7
2145	25.4	25.4	44.6	40.5	36.4	35.8	34.7
2200	24.4	24.4	44.6	40.5	36.4	35.8	34.7
2215	23.4	23.4	44.6	40.5	36.4	35.8	34.7
2230	22.4	22.4	44.6	40.5	36.4	35.8	34.7
2245	21.4	21.4	44.6	40.5	36.4	35.8	34.7
2300	20.4	20.4	44.6	40.5	36.4	35.8	34.7
2315	19.4	19.4	44.6	40.5	36.4	35.8	34.7
2330	18.4	18.4	44.6	40.5	36.4	35.8	34.7
2345	17.4	17.4	44.6	40.5	36.4	35.8	34.7
2400	16.4	16.4	44.6	40.5	36.4	35.8	34.7



92/03/12  
14:06:53

1  
THERMISTOR DATA  
SOIL PROFILE  
SADASH ENVIRONMENTAL AREA  
19 SEP 1990

TIME	3.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hr:min	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	22.1	26.9	29.8	34.1	36.8	35.9	34.7
0030	21.7	26.6	29.5	33.9	36.8	35.9	34.7
0045	21.2	26.3	29.2	33.6	36.6	35.9	34.7
0100	20.8	26.0	28.9	33.3	36.5	35.9	34.7
0115	20.7	25.7	28.6	33.1	36.4	35.9	34.7
0130	20.7	25.5	28.4	32.9	36.3	35.9	34.7
0145	20.6	25.3	28.1	32.6	36.2	35.9	34.6
0200	20.2	25.1	27.9	32.4	36.1	35.9	34.6
0215	19.8	24.8	27.7	32.2	36.0	35.9	34.6
0230	19.5	24.5	27.4	32.0	35.9	35.9	34.6
0245	19.5	24.3	27.2	31.9	35.9	36.0	34.7
0300	19.5	24.1	27.0	31.6	35.7	36.0	34.7
0315	19.1	24.0	26.8	31.4	35.6	36.0	34.7
0330	18.9	23.7	26.4	31.2	35.5	36.0	34.7
0345	18.8	23.5	26.4	31.0	35.4	36.0	34.7
0400	18.6	23.3	26.2	30.8	35.3	36.0	34.6
0415	18.6	23.1	26.0	30.6	35.2	36.0	34.6
0430	18.4	23.0	25.8	30.5	35.1	36.0	34.6
0445	18.1	22.8	25.6	30.3	35.0	35.9	34.6
0500	18.0	22.6	25.4	30.1	34.8	35.9	34.6
0515	17.8	22.4	25.2	29.9	34.7	35.9	34.6
0530	17.8	22.2	25.0	29.7	34.6	35.9	34.6
0545	17.6	22.1	24.9	29.5	34.5	35.9	34.6
0600	17.9	22.0	24.7	29.4	34.4	35.9	34.6
0615	18.0	22.0	24.6	29.2	34.3	35.9	34.6
0630	18.0	21.9	24.5	29.1	34.2	35.9	34.6
0645	18.3	21.9	24.4	28.9	34.1	35.9	34.6
0700	18.7	22.0	24.3	28.8	34.0	35.8	34.6
0715	18.7	22.2	24.3	28.6	33.8	35.8	34.6
0730	21.3	22.6	24.6	28.5	33.8	34.6	34.6
0745	23.1	23.3	24.6	28.4	33.7	35.8	34.6
0800	25.0	24.2	25.0	28.3	33.6	35.8	34.6
0815	27.1	25.2	25.5	28.3	33.5	35.8	34.6
0830	29.5	26.4	26.1	28.3	33.4	35.8	34.6
0845	31.7	27.7	26.8	28.3	33.2	35.8	34.6
0900	32.9	29.1	27.6	28.4	33.2	35.8	34.6
0915	35.9	30.4	28.5	28.4	33.1	35.8	34.6
0930	37.9	31.7	29.4	28.6	33.0	35.8	34.6
0945	40.1	33.1	30.3	29.0	32.9	35.8	34.6
1000	41.9	34.8	31.2	29.3	32.8	35.7	34.6
1015	43.7	35.8	32.2	29.6	32.7	35.7	34.6
1030	45.6	37.1	33.3	30.0	32.7	35.7	34.6
1045	46.5	38.3	34.2	30.4	32.6	35.7	34.6
1100	47.8	39.4	35.2	30.8	32.6	35.6	34.6
1115	48.4	40.3	36.1	31.2	32.6	35.6	34.6
1130	49.9	41.2	36.9	31.7	32.6	35.6	34.6
1145	51.2	42.2	37.6	32.1	32.6	35.6	34.6
1200	51.9	43.1	38.5	32.6	32.6	35.6	34.6
1215	53.0	43.9	39.2	33.0	32.7	35.6	34.6
1230	53.9	44.9	40.0	33.5	32.7	35.6	34.6
1245	54.6	45.5	40.7	34.0	32.8	35.6	34.6
1300	54.8	46.2	41.4	34.5	32.8	35.6	34.6
1315	54.6	46.7	42.0	35.0	32.9	35.6	34.6
1330	55.2	47.1	42.5	35.4	33.0	35.6	34.6
1345	54.5	47.4	43.0	35.9	33.2	35.6	34.6
1400	54.9	47.6	43.3	36.3	33.2	35.6	34.6

19sep90.spf

1415	54.2	47.8	43.7	36.7	33.2	35.3	34.6
1430	54.6	47.9	43.9	37.1	33.5	35.3	34.6
1445	50.6	47.7	44.2	37.4	33.6	35.3	34.6
1500	53.2	41.1	44.1	38.1	33.9	35.3	34.6
1515	51.0	47.2	44.1	38.1	34.0	35.3	34.6
1530	51.0	47.1	44.1	38.2	34.0	35.3	34.6
1545	51.0	46.7	44.2	38.2	34.0	35.3	34.6
1600	48.6	46.2	44.0	38.6	34.5	35.2	34.6
1615	47.8	45.7	43.8	38.6	34.5	35.1	34.6
1630	48.1	45.1	43.5	38.0	34.7	35.1	34.6
1645	44.7	44.4	43.2	38.2	34.8	35.1	34.6
1700	43.0	43.6	42.8	38.3	35.0	35.1	34.6
1715	41.1	42.7	42.3	38.3	35.1	35.1	34.6
1730	39.7	41.8	41.8	39.3	35.2	35.1	34.6
1745	38.2	40.8	41.2	39.3	35.4	35.1	34.6
1800	36.7	39.9	40.1	39.2	35.5	35.1	34.5
1815	35.2	39.0	40.1	39.1	35.6	35.1	34.5
1830	33.8	38.0	39.4	39.0	35.8	35.1	34.6
1845	32.6	37.1	38.8	38.8	35.8	35.1	34.6
1900	31.5	36.2	38.1	38.4	35.9	35.0	34.5
1915	30.6	35.5	37.5	38.4	36.0	35.0	34.5
1930	29.8	34.7	36.9	38.2	36.1	35.0	34.6
1945	29.0	34.0	36.3	37.9	36.1	35.0	34.6
2000	28.4	33.4	35.8	37.7	36.2	35.0	34.6
2015	27.7	32.8	35.2	37.4	36.3	35.1	34.6
2030	26.9	32.2	34.7	37.1	36.3	35.1	34.6
2045	26.2	31.5	34.2	36.8	36.3	35.1	34.6
2100	25.4	31.0	33.8	36.3	36.3	35.1	34.6
2115	25.0	30.4	33.3	36.3	36.3	35.1	34.6
2130	24.5	29.9	32.8	36.0	36.3	35.1	34.6
2145	24.1	29.4	32.3	35.7	36.3	35.1	34.6
2200	23.8	29.0	32.0	35.5	36.3	35.1	34.6
2215	23.7	28.6	31.6	35.2	36.2	35.1	34.6
2230	23.6	28.4	31.2	35.0	36.2	35.1	34.6
2245	23.6	28.1	30.9	34.7	36.1	35.1	34.6
2300	23.7	27.9	30.6	34.4	36.1	35.1	34.6
2315	23.4	27.6	30.4	34.2	36.0	35.1	34.6
2330	23.0	27.5	30.3	33.9	36.0	35.1	34.6
2345	23.3	27.3	29.9	33.7	35.9	35.1	34.5
2400	23.2	27.2	29.7	33.5	35.8	35.1	34.5

92/03/12  
14:07:00

TEHMISTOR DATA  
SOIL PROFILE  
SADAM ENVIRONMENTAL AREA  
20 SEP 1990

TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
Time	deg C	deg C	deg C	deg C	deg C	deg C	deg C
0015	32.9	27.1	29.5	33.2	35.9	35.2	34.6
0030	32.6	26.7	29.1	32.1	35.1	35.2	34.6
0045	32.3	26.7	28.1	32.9	35.4	35.1	34.6
0100	32.1	26.5	28.1	32.7	35.4	35.1	34.6
0115	31.8	26.2	28.7	32.5	35.5	35.2	34.6
0130	31.6	26.0	28.5	32.3	35.4	35.2	34.6
0145	31.5	25.7	28.3	32.1	35.3	35.2	34.6
0200	31.5	25.7	28.0	32.1	35.2	35.2	34.6
0215	31.3	25.4	27.9	31.9	35.2	35.2	34.5
0230	31.1	25.2	27.7	31.6	35.1	35.2	34.5
0245	30.9	25.0	27.5	31.4	35.0	35.2	34.5
0300	30.8	24.8	27.3	31.2	34.8	35.2	34.5
0315	30.6	24.6	27.1	31.0	34.7	35.2	34.5
0330	30.3	24.4	26.9	30.9	34.6	35.2	34.5
0345	30.2	24.2	26.7	30.7	34.5	35.2	34.5
0400	30.4	24.2	26.6	30.6	34.5	35.2	34.6
0415	30.1	24.1	26.5	30.4	34.4	35.2	34.6
0430	30.0	23.9	26.3	30.3	34.3	35.2	34.6
0445	29.8	23.8	26.2	30.1	34.2	35.2	34.5
0500	29.7	23.6	26.0	30.0	34.1	35.2	34.5
0515	29.7	23.5	25.8	29.8	34.0	35.2	34.5
0530	29.6	23.4	25.7	29.7	33.9	35.2	34.5
0545	29.7	23.3	25.6	29.5	33.8	35.2	34.5
0600	29.6	23.2	25.5	29.4	33.7	35.2	34.5
0615	29.6	23.1	25.4	29.3	33.6	35.2	34.5
0630	29.7	23.1	25.3	29.2	33.5	35.2	34.5
0645	29.8	23.0	25.2	29.0	33.4	35.2	34.5
0700	29.4	23.0	25.1	28.9	33.4	35.2	34.5
0715	29.4	23.2	25.1	28.8	33.3	35.2	34.5
0730	29.1	23.6	25.2	28.7	33.2	35.2	34.5
0745	29.2	23.9	25.3	28.6	33.1	35.2	34.5
0800	29.9	24.3	25.4	28.5	33.0	35.2	34.5
0815	29.2	24.9	25.7	28.4	32.9	35.1	34.4
0830	27.3	25.6	26.0	28.4	32.8	35.2	34.5
0845	28.6	26.7	26.5	28.4	32.8	35.2	34.5
0900	30.1	27.5	27.1	28.5	32.7	35.2	34.5
0915	32.1	28.5	27.6	28.5	32.6	35.1	34.4
0930	36.0	29.0	28.3	28.6	32.5	35.1	34.4
0945	38.3	31.6	29.2	28.8	32.5	35.1	34.4
1000	42.5	33.0	30.2	29.0	32.3	35.1	34.4
1015	44.2	34.5	31.3	29.2	32.3	35.1	34.4
1030	44.2	35.9	32.3	29.5	32.2	35.0	34.5
1045	44.6	37.0	33.3	29.9	32.2	35.0	34.4
1100	44.8	38.6	34.2	30.3	32.2	35.0	34.4
1115	47.0	39.6	34.9	30.7	32.2	34.9	34.4
1130	47.0	40.2	36.4	31.5	32.2	34.9	34.4
1145	47.9	41.0	37.0	31.9	32.2	34.9	34.4
1200	49.2	41.0	37.0	31.9	32.2	34.9	34.4
1215	51.3	41.9	37.8	32.3	32.2	34.9	34.4
1230	52.0	43.0	38.5	32.7	32.2	34.8	34.4
1245	52.6	43.8	39.3	33.1	32.2	34.8	34.4
1300	54.0	44.6	40.0	33.6	32.2	34.8	34.4
1315	53.8	45.2	40.7	34.0	32.4	34.8	34.4
1330	53.8	45.6	41.2	34.5	32.4	34.8	34.4
1345	54.1	46.0	41.7	34.9	32.5	34.8	34.4
1400	52.9	46.3	42.2	35.3	32.7	34.8	34.4

20sep90.spf

1

1415	52.6	46.2	42.5	35.9	32.8	34.7	34.4
1430	53.2	46.4	42.7	36.2	32.9	34.7	34.4
1445	52.1	46.6	43.0	36.3	33.0	34.7	34.4
1500	50.3	45.1	43.1	36.3	33.1	34.7	34.4
1515	52.0	45.5	43.2	37.4	33.4	34.6	34.4
1530	52.3	46.1	43.3	37.8	33.5	34.6	34.4
1545	52.3	46.2	43.4	37.8	33.7	34.6	34.4
1600	50.4	45.0	43.4	38.0	33.8	34.6	34.4
1615	49.9	45.0	43.4	38.3	34.0	34.6	34.4
1630	48.5	45.0	43.4	38.3	34.0	34.6	34.4
1645	47.5	45.1	43.2	38.5	34.1	34.5	34.3
1700	45.1	44.4	42.9	38.5	34.2	34.5	34.3
1715	43.3	43.5	42.5	38.7	34.3	34.5	34.3
1730	42.5	42.6	42.2	38.7	34.5	34.5	34.3
1745	39.7	41.5	41.6	38.7	34.6	34.5	34.3
1800	37.9	40.7	41.0	38.8	34.8	34.5	34.3
1815	35.9	39.5	40.4	38.8	34.9	34.5	34.3
1830	34.6	38.5	39.7	38.5	35.0	34.5	34.3
1845	32.5	37.7	39.1	38.3	35.2	34.5	34.3
1900	32.5	36.8	38.4	38.3	35.2	34.5	34.3
1915	31.9	36.1	37.6	38.2	35.4	34.5	34.4
1930	31.3	35.4	37.3	38.0	35.4	34.5	34.4
1945	31.1	34.9	36.7	37.7	35.5	34.5	34.4
2000	30.6	34.5	36.3	37.5	35.6	34.5	34.4
2015	30.0	34.0	35.9	37.3	35.6	34.5	34.4
2030	29.4	33.5	35.4	37.0	35.7	34.5	34.4
2045	28.8	33.0	35.0	36.8	35.7	34.5	34.3
2100	28.2	32.5	34.7	36.6	35.8	34.5	34.4
2115	27.5	32.0	34.2	36.4	35.8	34.5	34.4
2130	27.1	31.5	33.8	36.1	35.8	34.5	34.4
2145	26.5	31.1	33.4	35.9	35.8	34.5	34.3
2200	25.9	30.7	33.1	35.7	35.8	34.5	34.6
2215	25.2	30.2	32.7	35.5	35.8	34.6	34.4
2230	24.8	29.7	32.2	35.2	35.7	34.6	34.6
2245	24.5	29.3	31.9	35.0	35.7	34.6	34.3
2300	24.1	28.9	31.5	34.7	35.7	34.6	34.3
2315	23.6	28.5	31.2	34.5	35.7	34.6	34.4
2330	23.4	28.2	30.8	34.3	35.6	34.6	34.4
2345	23.2	27.9	30.5	34.0	35.6	34.6	34.4
2400	23.0	27.6	30.2	33.8	35.5	34.6	34.3

1

21sep90.spf

92/03/12  
14:07:11

TEHMISTOR DATA  
SOIL PROFILE  
SADARM ENVIRONMENTAL AREA  
21 SEP 1990

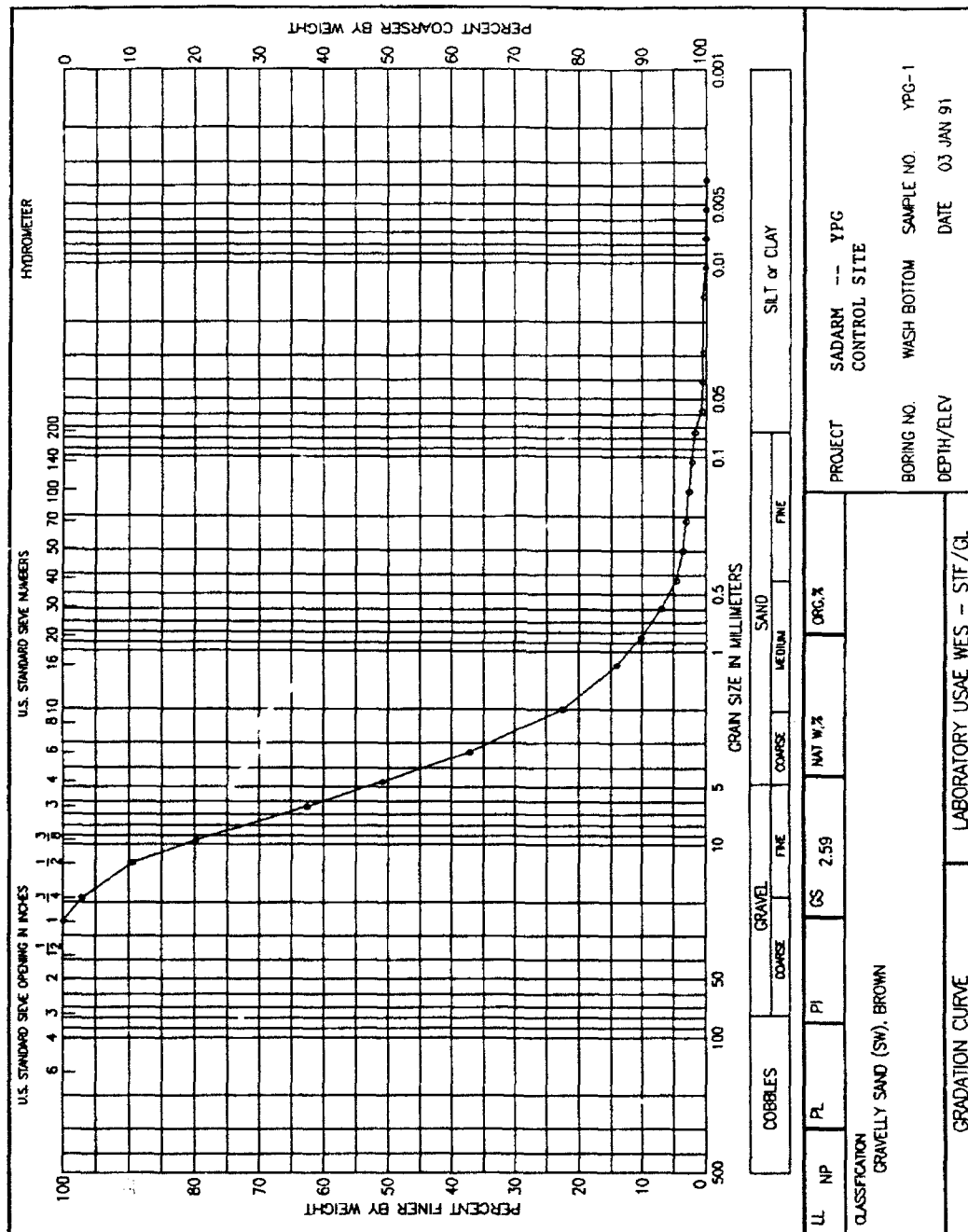
TIME	0.0cm	-2.5cm	-5.0cm	-10.0cm	-20.0cm	-40.0cm	-70.0cm
hmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	22.8	27.3	29.9	33.5	35.4	34.6	34.3
0030	22.7	27.1	29.6	33.3	35.4	34.6	34.3
0045	23.0	27.0	29.4	33.2	35.3	34.7	34.4
0100	23.0	26.9	29.2	32.9	35.3	34.7	34.4
0115	23.0	26.8	29.1	32.7	35.2	34.7	34.4
0130	22.9	26.6	28.9	32.5	35.1	34.7	34.4
0145	22.8	26.5	28.7	32.3	35.0	34.7	34.4
0200	22.7	26.4	28.6	32.2	35.0	34.7	34.4
0215	22.6	26.2	28.4	32.0	34.9	34.8	34.4
0230	22.5	26.1	28.3	31.8	34.8	34.8	34.3
0245	22.4	26.0	28.1	31.6	34.7	34.8	34.3
0300	22.3	25.9	28.0	31.5	34.6	34.8	34.3
0315	22.2	25.7	27.8	31.3	34.5	34.8	34.3
0330	22.1	25.6	27.7	31.2	34.5	34.8	34.3
0345	21.9	25.5	27.6	31.0	34.4	34.8	34.3
0400	21.7	25.3	27.4	30.9	34.3	34.8	34.3
0415	21.6	25.2	27.3	30.8	34.2	34.8	34.3
0430	21.5	25.0	27.1	30.6	34.1	34.8	34.3
0445	21.4	24.9	27.0	30.5	34.0	34.8	34.3
0500	21.4	24.8	26.9	30.3	33.9	34.8	34.3
0515	21.4	24.7	26.7	30.2	33.8	34.8	34.3
0530	21.3	24.6	26.6	30.1	33.8	34.8	34.3
0545	21.1	24.5	26.5	30.0	33.7	34.8	34.3
0600	21.0	24.4	26.4	29.8	33.6	34.8	34.2
0615	20.9	24.3	26.3	29.7	33.5	34.8	34.2
0630	20.8	24.1	26.1	29.6	33.4	34.8	34.2

# **Appendix C**

## **Soil Classification Data**

---

Soil gradation curves along with accompanying sieve data tabulations for each of the soil classification samples taken from the Control Site at Yuma Proving Ground, AZ, are included in the following pages.



# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: WASH BOTTOM SAMPLE: YPG-1 DF: MD0391 .DAT  
DEPTH: DATE: 03 JAN 91

NON-PLASTIC GS: 2.59 WC: .00  
CLASSIFICATION: 108  
GRAVELLY SAND (SW), BROWN

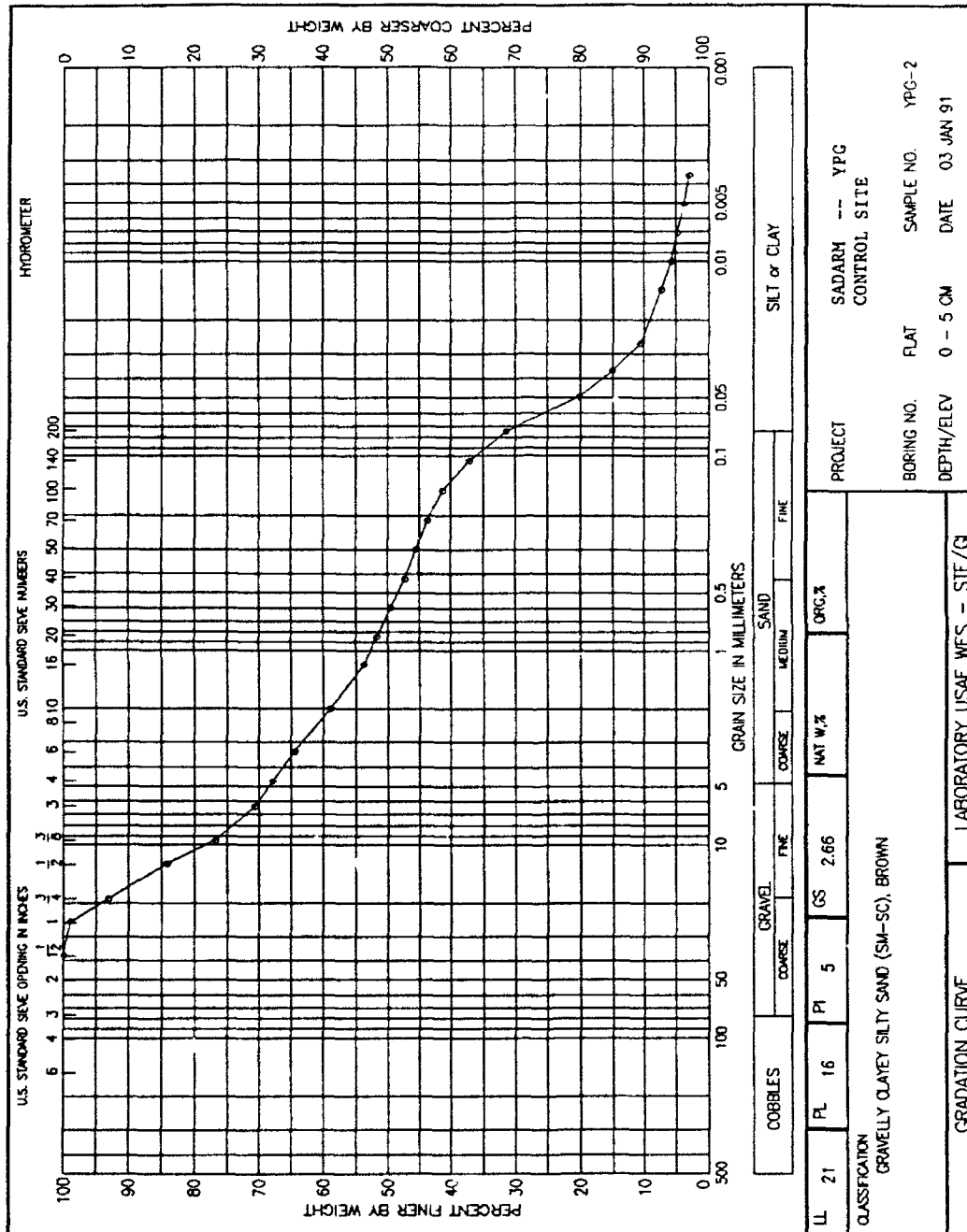
TOTAL WEIGHT OF SAMPLE: 2343.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 61.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	1 in	25.000	100.0	.0
67.0	3/4 in	19.100	97.1	2.9
178.8	1/2 in	12.500	89.5	10.5
228.6	3/8 in	9.500	79.8	20.2
401.3	No 3	6.350	62.6	37.4
273.7	No 4	4.750	50.9	49.1
319.5	No 6	3.350	37.3	62.7
346.0	No 10	2.000	22.5	77.5
23.1	No 16	1.180	14.0	86.0
33.2	No 20	.850	10.3	89.7
42.1	No 30	.600	7.0	93.0
48.8	No 40	.425	4.6	95.4
51.3	No 50	.300	3.6	96.4
52.8	No 70	.212	3.1	96.9
53.9	No 100	.150	2.7	97.3
55.1	No 140	.106	2.2	97.8
56.3	No 200	.075	1.8	98.2
HYDROMETER:				
RDGS	TEMP			
1.3	22.5	.0577	.8	99.2
1.0	22.5	.0409	.6	99.4
.8	22.5	.0290	.5	99.5
.8	22.5	.0150	.5	99.5
.3	22.5	.0106	.2	99.8
.2	22.5	.0075	.1	99.9
.1	22.5	.0053	.1	99.9
.1	22.5	.0038	.1	99.9

PERCENT GRAVEL = 49.1 ← 49.061  
PERCENT SAND = 49.1 ← 49.139  
PERCENT FINES = 1.8

D60 = 5.99  
D30 = 2.68  
D10 = .83  
CU = 7.25  
CC = 1.45

EDE



# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: FLAT SAMPLE: YPG-2 DF: MD0391 .DAT  
DEPTH: 0 - 5 CM DATE: 03 JAN 91

LL: 21 PL: 16 PI: 5 GS: 2.66 WC: .00  
CLASSIFICATION: 126

GRAVELLY CLAYEY SILTY SAND (SM-SC), BROWN

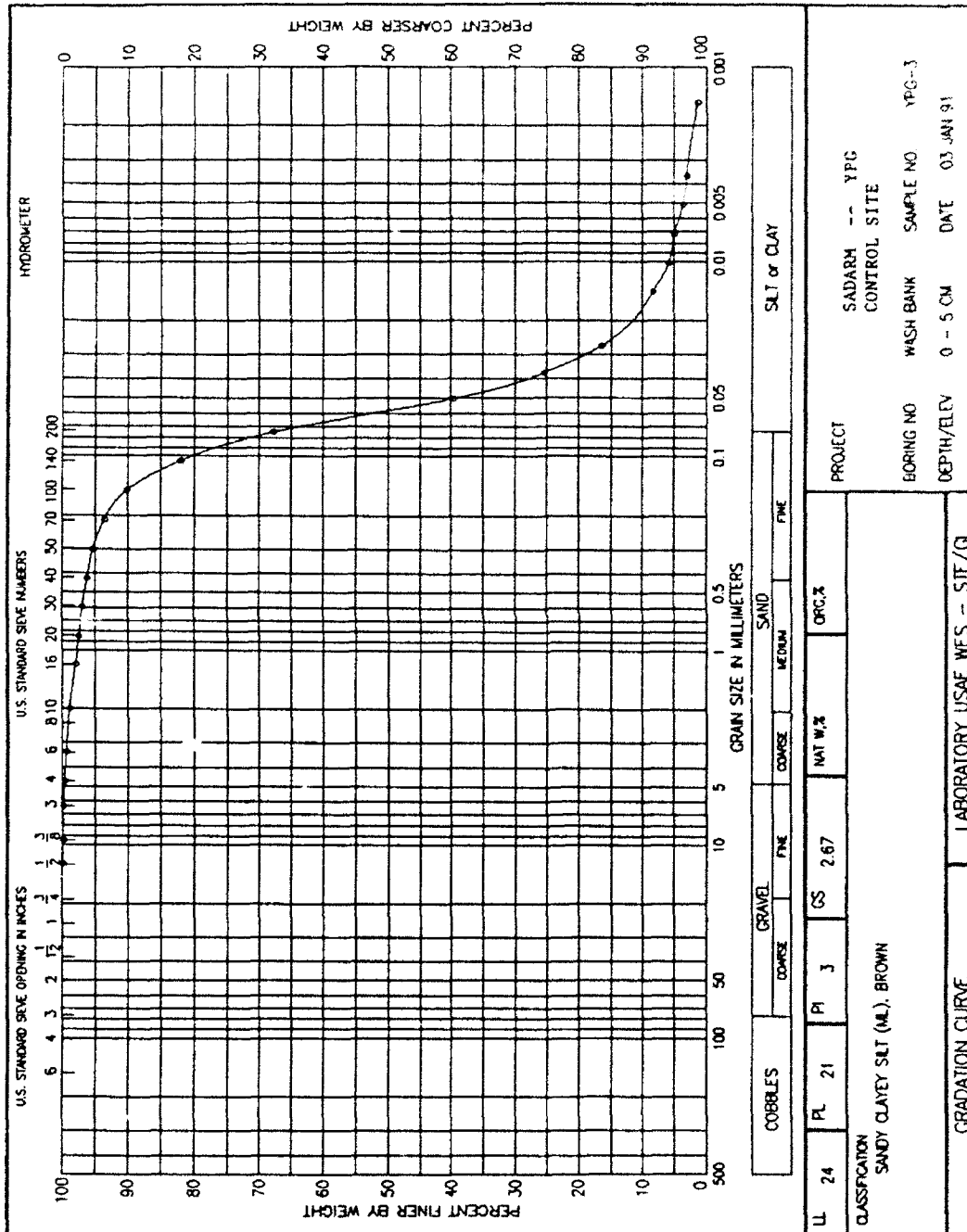
TOTAL WEIGHT OF SAMPLE: 3051.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 76.2 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	1.5 in	37.500	100.0	.0
29.5	1 in	25.000	99.0	1.0
179.3	3/4 in	19.100	93.2	6.8
273.8	1/2 in	12.500	84.2	15.8
225.6	3/8 in	9.500	76.8	23.2
183.8	No 3	6.350	70.8	29.2
85.8	No 4	4.750	68.0	32.0
106.4	No 6	3.350	64.5	35.5
169.1	No 10	2.000	58.9	41.1
6.6	No 16	1.180	53.8	46.2
9.3	No 20	.850	51.7	48.3
12.1	No 30	.600	49.6	50.4
15.1	No 40	.425	47.2	52.8
17.3	No 50	.300	45.5	54.5
19.7	No 70	.212	43.7	56.3
22.8	No 100	.150	41.3	58.7
28.1	No 140	.106	37.2	62.8
35.4	No 200	.075	31.5	68.5
HYDROMETER:				
RDGS	TEMP			
16.3	22.5	.0497	20.2	79.8
12.1	22.5	.0366	15.0	85.0
8.6	22.5	.0267	10.7	89.3
5.9	22.5	.0141	7.3	92.7
4.7	22.0	.0100	5.7	94.3
3.9	22.5	.0071	4.8	95.2
3.1	22.5	.0051	3.8	96.2
2.4	22.5	.0036	3.0	97.0

PERCENT GRAVEL = 32.0  
PERCENT SAND = 36.4  
PERCENT FINES = 31.5

EDE





# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: WASH BANK SAMPLE: YPG-3 DF: MD0391A .DAT  
DEPTH: 0 - 5 CM DATE: 03 JAN 91

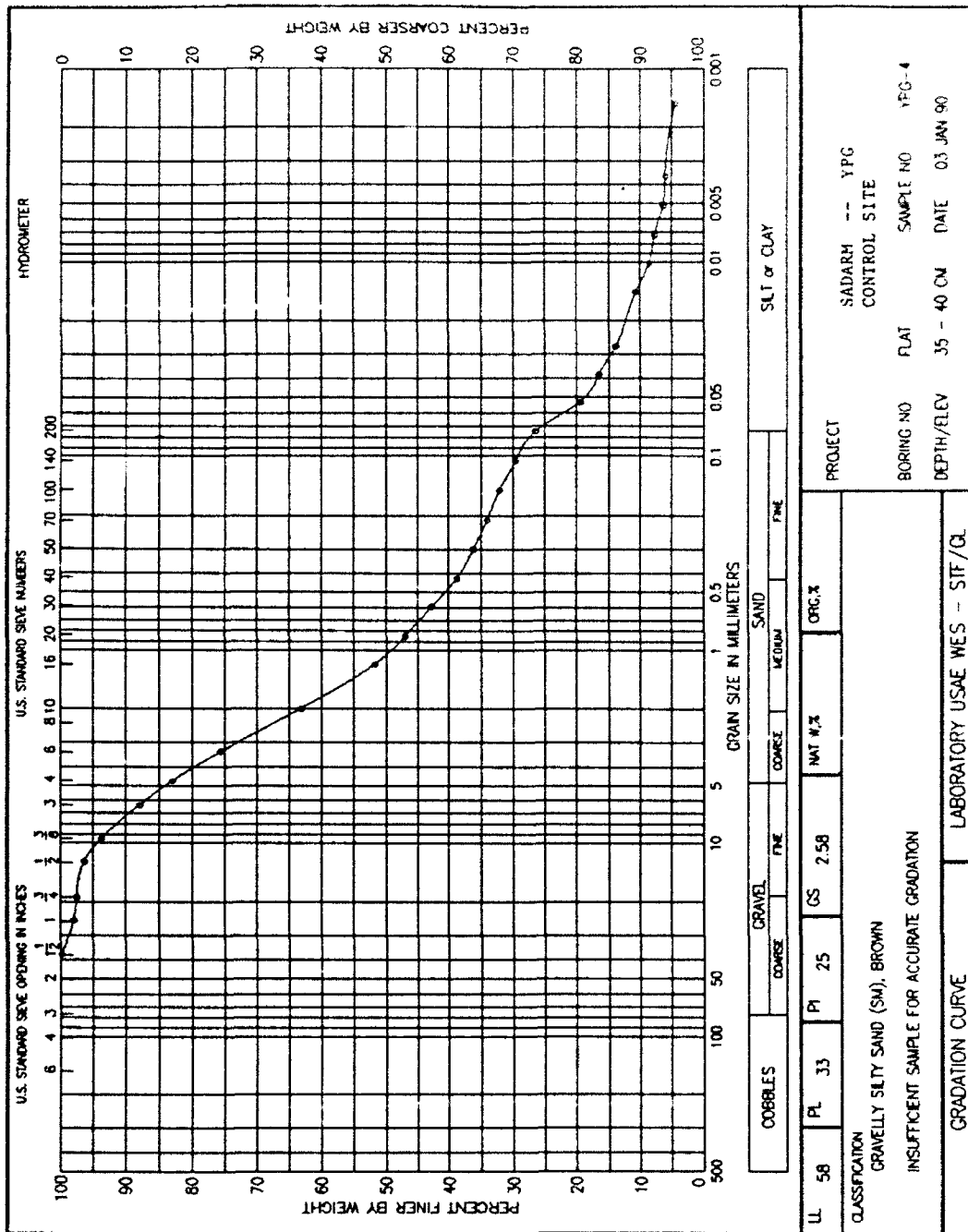
LL: 24 PL: 21 PI: 3 GS: 2.67 WC: .00  
CLASSIFICATION: 144  
SANDY CLAYEY SILT (ML), BROWN

TOTAL WEIGHT OF SAMPLE: 2425.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 56.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	1/2 in	12.500	100.0	.0
1.4	3/8 in	9.500	99.9	.1
2.4	No 3	6.350	99.8	.2
3.9	No 4	4.750	99.7	.3
5.2	No 6	3.350	99.5	.5
13.1	No 10	2.000	98.9	1.1
.5	No 16	1.180	98.1	1.9
.8	No 20	.850	97.5	2.5
1.1	No 30	.600	97.0	3.0
1.5	No 40	.425	96.3	3.7
2.0	No 50	.300	95.4	4.6
3.0	No 70	.212	93.7	6.3
5.0	No 100	.150	90.2	9.8
9.7	No 140	.106	82.0	18.0
17.8	No 200	.075	67.9	32.1
HYDROMETER:				
RDGS	TEMP			
14.2	22.5	.0506	39.6	60.4
9.1	22.5	.0374	25.4	74.6
5.9	22.5	.0272	16.5	83.5
3.0	22.5	.0144	8.4	91.6
2.2	22.0	.0102	5.9	94.1
1.8	22.5	.0072	5.0	95.0
1.3	22.5	.0051	3.6	96.4
1.1	22.5	.0036	3.1	96.9
.9	20.5	.0015	1.4	98.6

PERCENT GRAVEL = .3  
PERCENT SAND = 31.8  
PERCENT FINES = 67.9

EDE



# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: FLAT SAMPLE: YPG-4 DF: MD0391 .DAT  
DEPTH: 35 - 40 CM DATE: 03 JAN 90

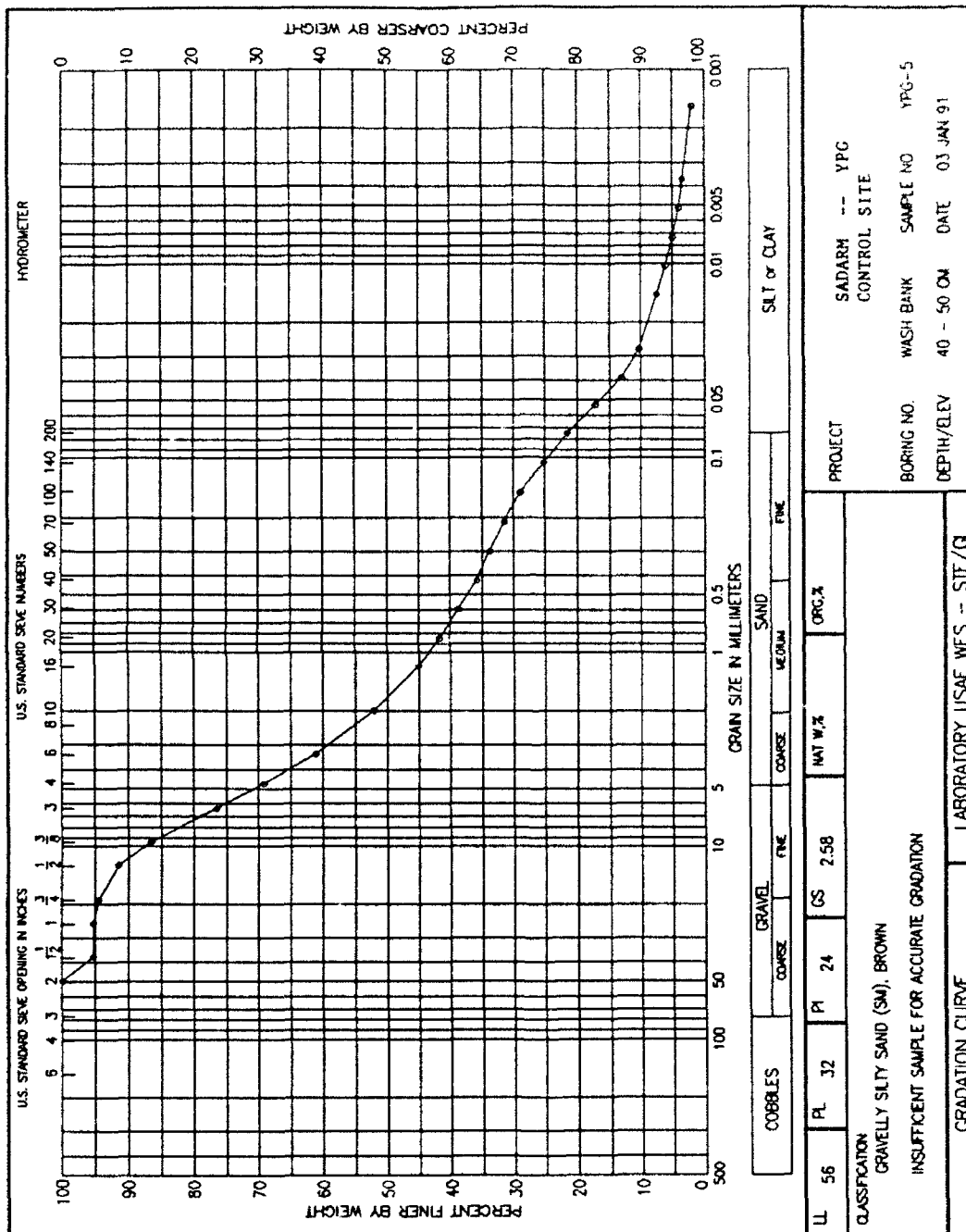
SL: 58 PL: 33 PI: 25 GS: 2.58 WC: .00  
CLASSIFICATION: 162  
GRAVELLY SILTY SAND (SM), BROWN

TOTAL WEIGHT OF SAMPLE: 2396.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 68.0 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	1.5 in	37.500	100.0	.0
47.2	1 in	25.000	98.0	2.0
10.9	3/4 in	19.100	97.6	2.4
27.5	1/2 in	12.500	96.4	3.6
64.0	3/8 in	9.500	93.8	6.2
138.7	No 3	6.350	88.0	12.0
117.6	No 4	4.750	83.1	16.9
178.6	No 6	3.350	75.6	24.4
296.3	No 10	2.000	63.2	36.8
12.3	No 16	1.180	51.8	48.2
17.4	No 20	.850	47.1	52.9
22.0	No 30	.600	42.8	57.2
26.3	No 40	.425	38.8	61.2
29.0	No 50	.300	36.3	63.7
31.3	No 70	.212	34.1	65.9
33.3	No 100	.150	32.3	67.7
36.1	No 140	.106	29.7	70.3
39.5	No 200	.075	26.5	73.5
HYDROMETER:				
RDGS	TEMP			
13.0	21.5	.0532	19.4	80.6
11.1	21.5	.0383	16.6	83.4
9.4	21.5	.0275	14.0	86.0
7.3	21.5	.0144	10.8	89.2
5.9	21.5	.0103	8.7	91.3
5.3	21.5	.0073	7.7	92.3
4.3	22.0	.0052	6.4	93.6
4.1	22.0	.0037	6.1	93.9
3.2	21.5	.0015	4.6	95.4

PERCENT GRAVEL = 16.9  
PERCENT SAND = 56.6  
PERCENT FINES = 26.5

EDE



# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: WASH BANK SAMPLE: YPG-5 DF: MD0391A .DAT  
DEPTH: 40 - 50 CM DATE: 03 JAN 91

LL: 56 PL: 32 PI: 24 GS: 2.58 WC: .00  
CLASSIFICATION: 180  
GRAVELLY SILTY SAND (SM), BROWN

TOTAL WEIGHT OF SAMPLE: 2032.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 54.3 gms.  
INSUFFICIENT SAMPLE FOR ACCURATE GRADATION

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	2 in	50.000	100.0	.0
94.0	1.5 in	37.500	95.4	4.6
.0	1 in	25.000	95.4	4.6
16.5	3/4 in	19.100	94.6	5.4
61.0	1/2 in	12.500	91.6	8.4
99.7	3/8 in	9.500	86.7	13.3
205.7	No 3	6.350	76.5	23.5
148.0	No 4	4.750	69.2	30.8
163.8	No 6	3.350	61.2	38.8
183.6	No 10	2.000	52.2	47.8
7.3	No 16	1.180	45.1	54.9
10.9	No 20	.850	41.7	58.3
13.9	No 30	.600	38.8	61.2
16.9	No 40	.425	35.9	64.1
19.0	No 50	.300	33.9	66.1
21.4	No 70	.212	31.6	68.4
24.2	No 100	.150	28.9	71.1
28.1	No 140	.106	25.2	74.8
31.9	No 200	.075	21.5	78.5
HYDROMETER:				
RDGS	TEMP			
11.0	22.5	.0535	17.3	82.7
8.4	22.5	.0387	13.2	86.8
6.6	22.5	.0278	10.4	89.6
4.8	22.5	.0146	7.5	92.5
3.9	22.5	.0104	6.1	93.9
3.2	22.5	.0074	5.0	95.0
2.6	22.5	.0052	4.1	95.9
2.1	23.0	.0037	3.5	96.5
1.7	20.5	.0016	2.0	98.0

PERCENT GRAVEL = 30.8  
PERCENT SAND = 47.7  
PERCENT FINES = 21.5

EDE



# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: WASH BANK SAMPLE: YPG-6 DF: MD0391 .DAT  
DEPTH: 65 - 70 CM DATE: 03 JAN 91

SL: 65 PL: 41 PI: 24 GS: 2.56 WC: .00  
CLASSIFICATION: 198  
GRAVELLY SILTY SAND (SM), BROWN

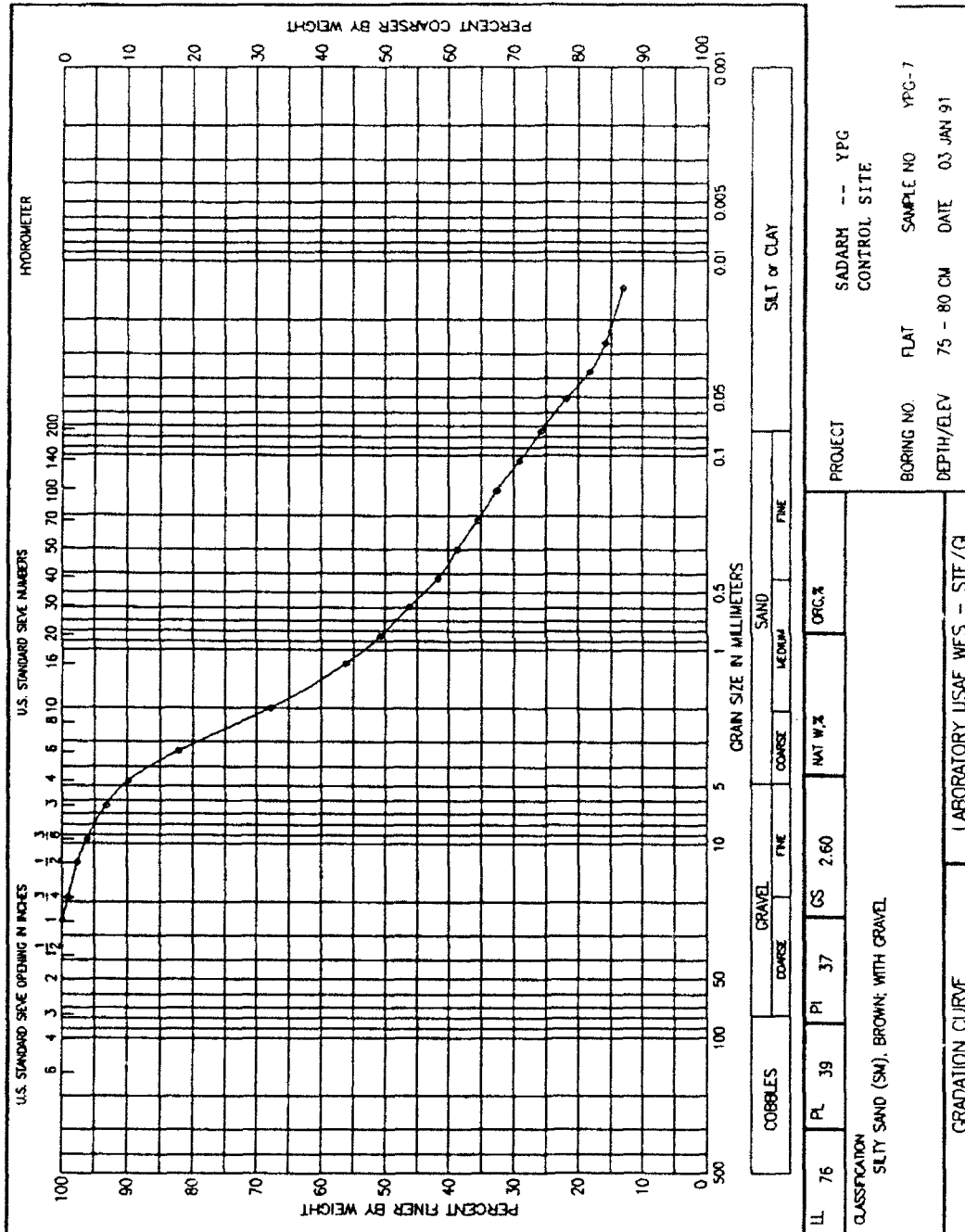
TOTAL WEIGHT OF SAMPLE: 2539.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 71.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	1.5 in	37.500	100.0	.0
50.3	1 in	25.000	98.0	2.0
30.3	3/4 in	19.100	96.8	3.2
98.1	1/2 in	12.500	93.0	7.0
89.0	3/8 in	9.500	89.5	10.5
157.9	No 3	6.350	83.2	16.8
190.5	No 4	4.750	75.7	24.3
301.1	No 6	3.350	63.9	36.1
391.8	No 10	2.000	48.4	51.6
12.0	No 16	1.180	40.4	59.6
17.5	No 20	.850	36.7	63.3
22.8	No 30	.600	33.1	66.9
28.4	No 40	.425	29.3	70.7
32.5	No 50	.300	26.5	73.5
36.2	No 70	.212	24.1	75.9
39.2	No 100	.150	22.0	78.0
43.0	No 140	.106	19.5	80.5
47.3	No 200	.075	16.6	83.4
HYDROMETER:				
RDGS	TEMP			
11.0	22.5	.0539	12.2	87.8
9.1	22.5	.0387	10.1	89.9
7.6	22.5	.0277	8.4	91.6
5.9	22.5	.0145	6.5	93.5
4.3	22.5	.0104	4.8	95.2
3.3	22.5	.0074	3.6	96.4
2.5	22.5	.0053	2.8	97.2
2.1	23.0	.0037	2.4	97.6
1.8	20.5	.0016	1.5	98.5

PERCENT GRAVEL = 24.3  
PERCENT SAND = 59.2  
PERCENT FINES = 16.6

EDE





# SIEVE ANALYSIS

PROJECT: SADARM -- YPG  
CONTROL SITE

BORING: FLAT SAMPLE: YPG-7 DF: MD0391 .DAT  
DEPTH: 75 - 80 CM DATE: 03 JAN 91

SL: 76 PL: 39 PI: 37 GS: 2.60 WC: .00  
CLASSIFICATION: 216  
SILTY SAND (SM), BROWN; WITH GRAVEL

TOTAL WEIGHT OF SAMPLE: 4194.0 gms.  
PARTIAL WEIGHT AFTER SPLIT: 75.7 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	CUMULATIVE PERCENTS
.0	1 in	25.000	100.0	.0
36.1	3/4 in	19.100	99.1	.9
60.7	1/2 in	12.500	97.7	2.3
62.0	3/8 in	9.500	96.2	3.8
121.6	No 3	6.350	93.3	6.7
146.3	No 4	4.750	89.8	10.2
318.4	No 6	3.350	82.2	17.8
605.1	No 10	2.000	67.8	32.2
12.9	No 16	1.180	56.3	43.7
19.1	No 20	.850	50.7	49.3
24.1	No 30	.600	46.2	53.8
29.1	No 40	.425	41.7	58.3
32.5	No 50	.300	38.7	61.3
36.0	No 70	.212	35.6	64.4
39.2	No 100	.150	32.7	67.3
43.2	No 140	.106	29.1	70.9
46.9	No 200	.075	25.8	74.2
HYDROMETER:				
RDGS	TEMP			
15.1	22.0	.0512	21.8	78.2
12.5	22.5	.0371	18.2	81.8
10.9	22.5	.0266	15.9	84.1
9.0	22.5	.0140	13.1	86.9

PERCENT GRAVEL = 10.2  
PERCENT SAND = 64.0  
PERCENT FINES = 25.8

EDE

## Appendix D

### Photographs of Dominant Plant Species

---

This appendix contains photographs of most of the dominant plant species found at the Sense and Destroy Armor test area and the Control Site. In three cases, for the plants designated, CEMI, I.ATR, and OLTE, photos taken before and after local heavy rains show how much vegetation appearance can change as a result of different recent weather histories. These are not before-and-after photographs of the same plants; however, the change in leaf density is typical.

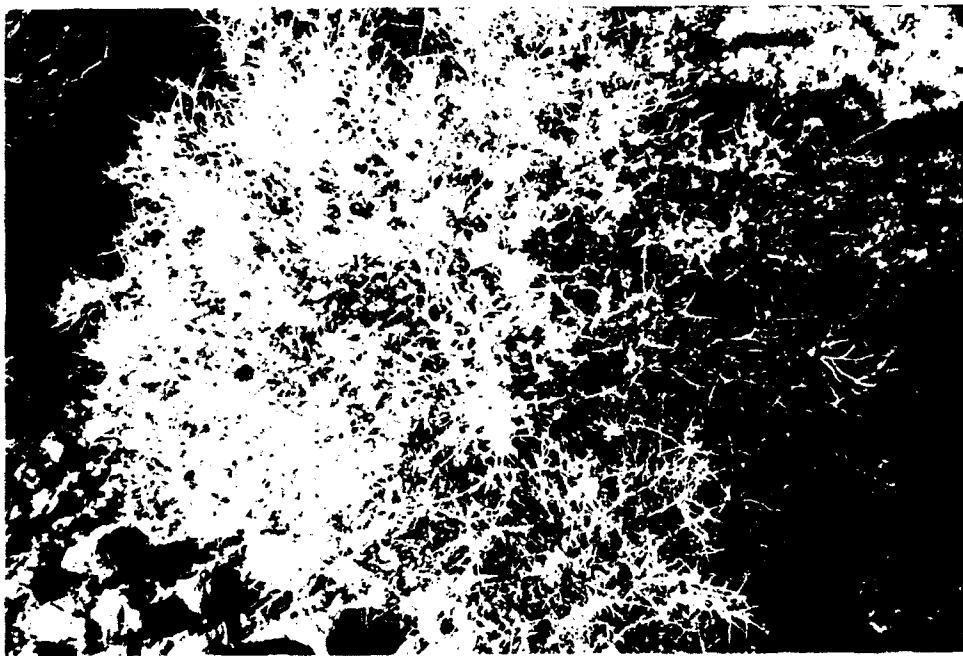


Figure D1. *Ambrosia dumosa* (white bur sage), AMDU



a. Full view

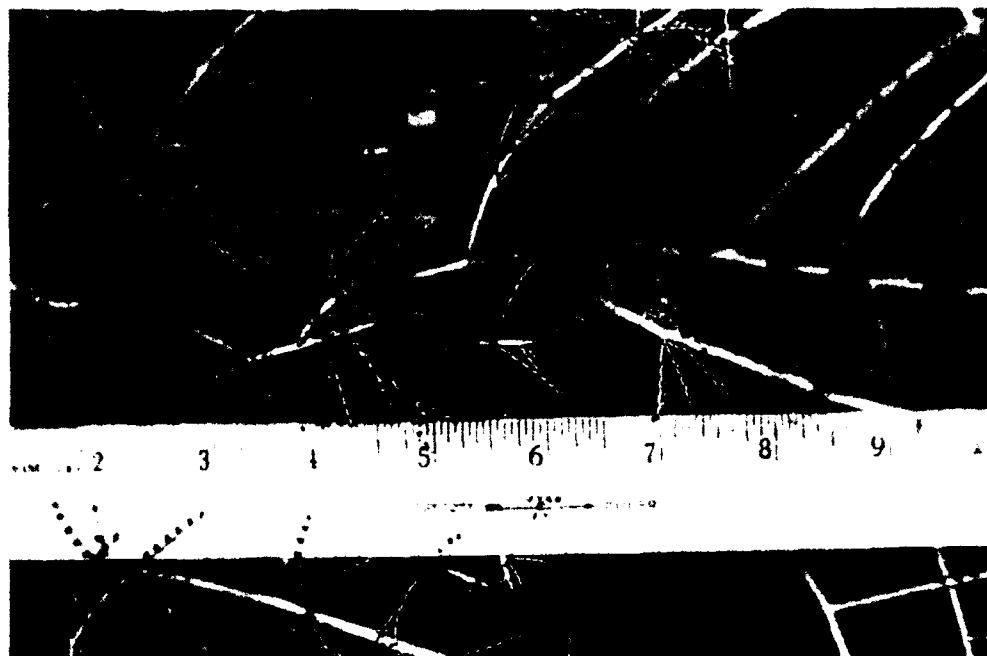


b. Close-up view

Figure D2. *Cercidium microphyllum* (yellow palo verde), CEMI, prerin



a. Full view



b. Close-up view

Figure D3 *Cercidium microphyllum* (yellow palo verde), CEMI, postrain

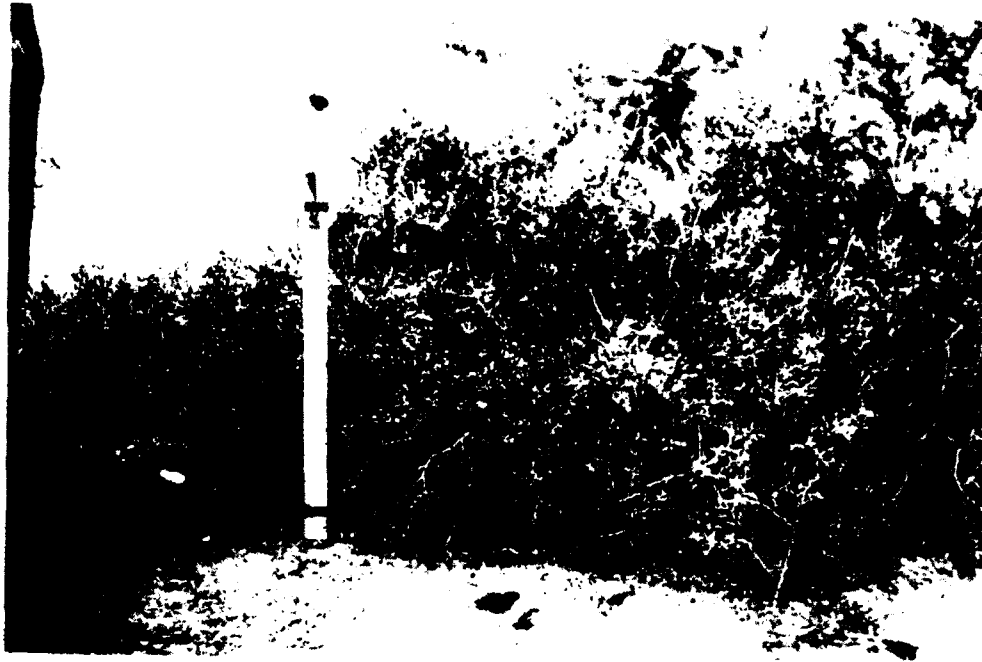


a. Full view

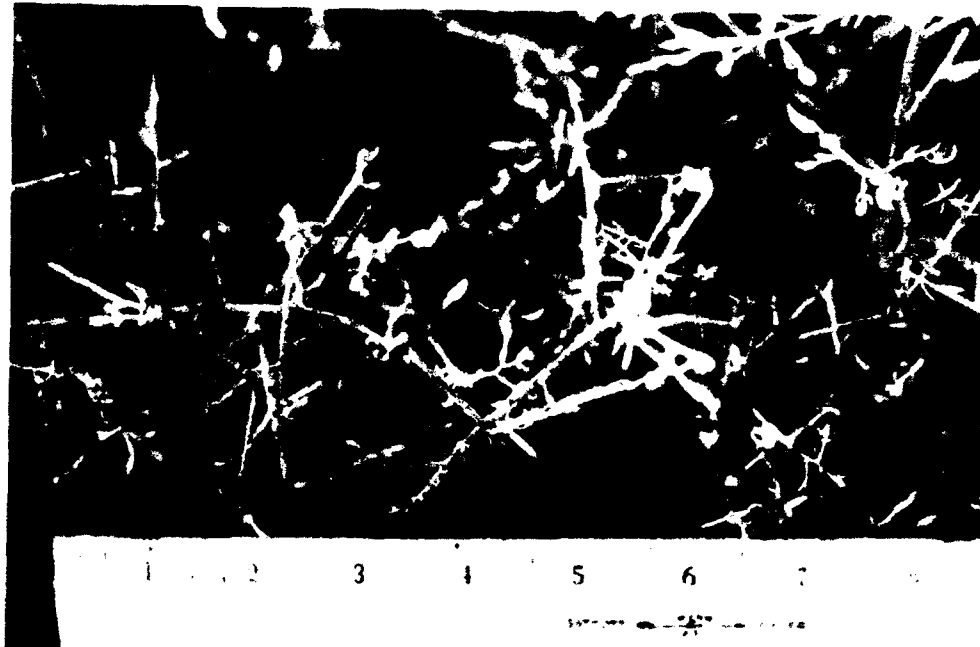


b. Close-up view

Figure D4. *Encelia farinosa* (brittlebush), ENFA



a. Full view



b. Close-up view

Figure D5. *Krameria paravifolia* (white ratany), KRPA



a. Full view



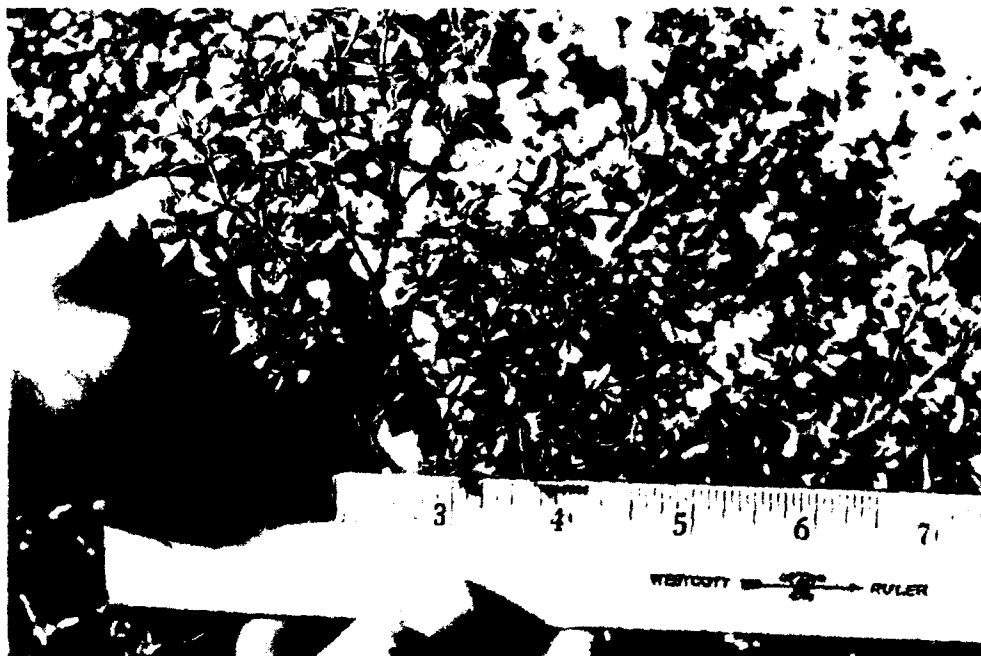
b. Close-up view

Figure D6. *Larrea tridentata* (creosote bush), LATR, preraim





a. Full view



b. Close-up view

Figure D7. *Larrea tridentata* (creosote bush), LATR, postrain



a. Full view



b. Close-up view

Figure D8. *Lycium* sp. (wolfberry), LY---



a. Full view



b. Close-up view

Figure D9. *Olyneya tesota* (desert ironwood), OLTE, prerin



a. Full view



b. Close-up view

Figure D10. *Olyneya tesota* (desert ironwood), OLTE, postrain

## Appendix E

# Photographs Depicting Thermal Infrared Image Views

---

The following photographs taken from the observation tower at the Control Site near the Sense and Destroy Armor test area, Yuma Proving Ground, AZ, are intended to give the general impression of how the thermal infrared imaging cameras were pointed for each recording. The number of degrees shown on each figure represents the depression angle of the cameras.

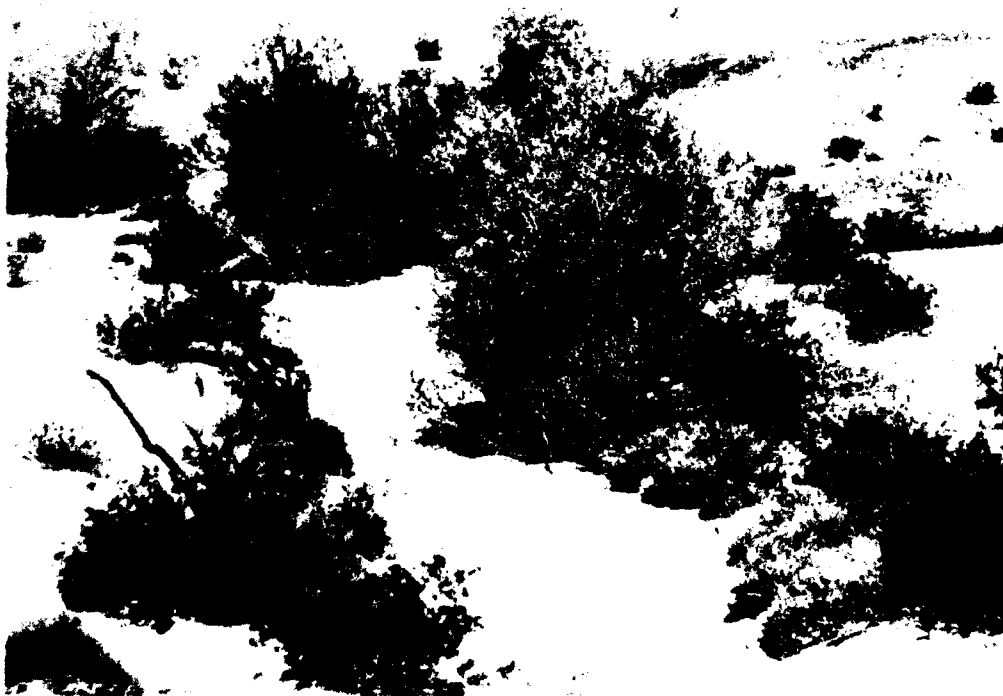


Figure E1. Scene 1, west wash, 7.5 deg

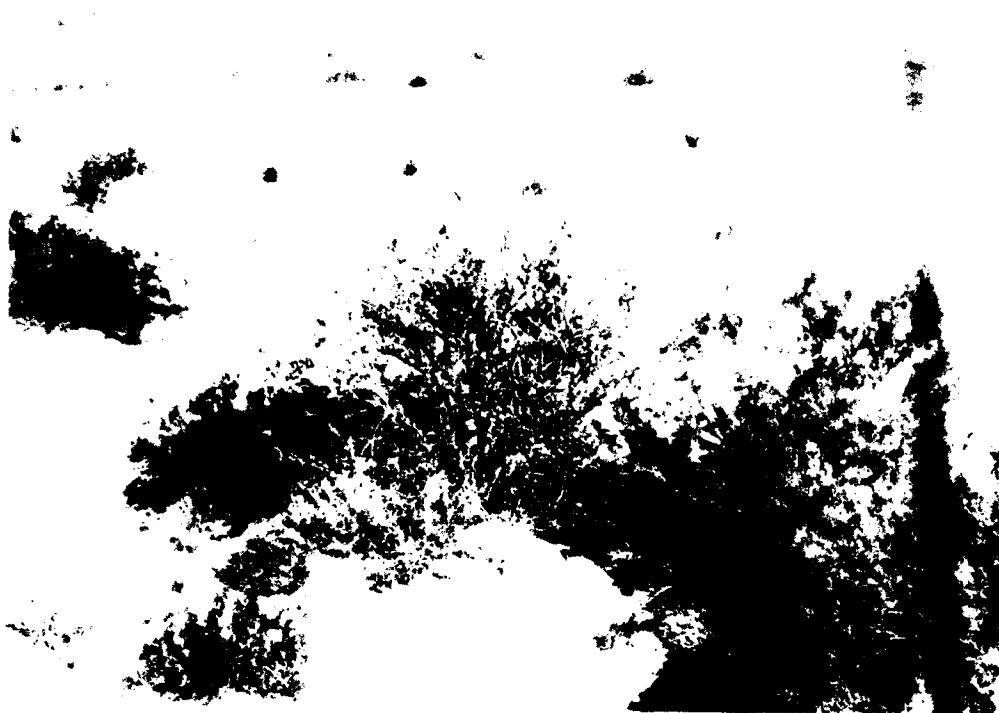


Figure E2. Scene 2, 14.5 deg



Figure E3. Scene 3, 22.5 deg

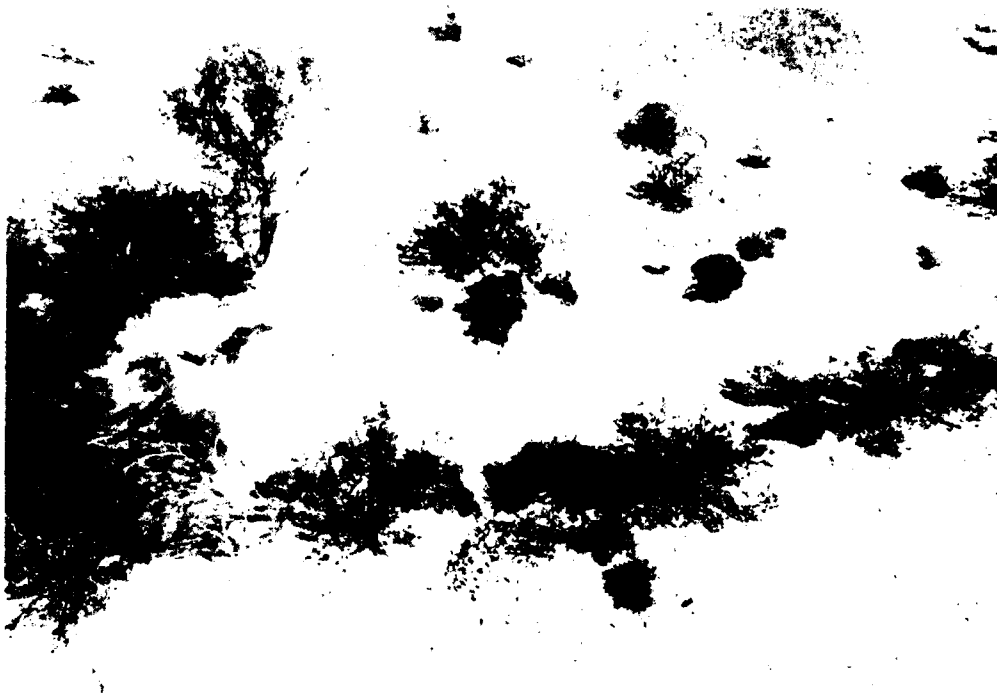


Figure E4. Scene 4, 17.5 deg



Figure E5. Scene 5, 20.5 deg



Figure E6. Scene 6, 32.5 deg

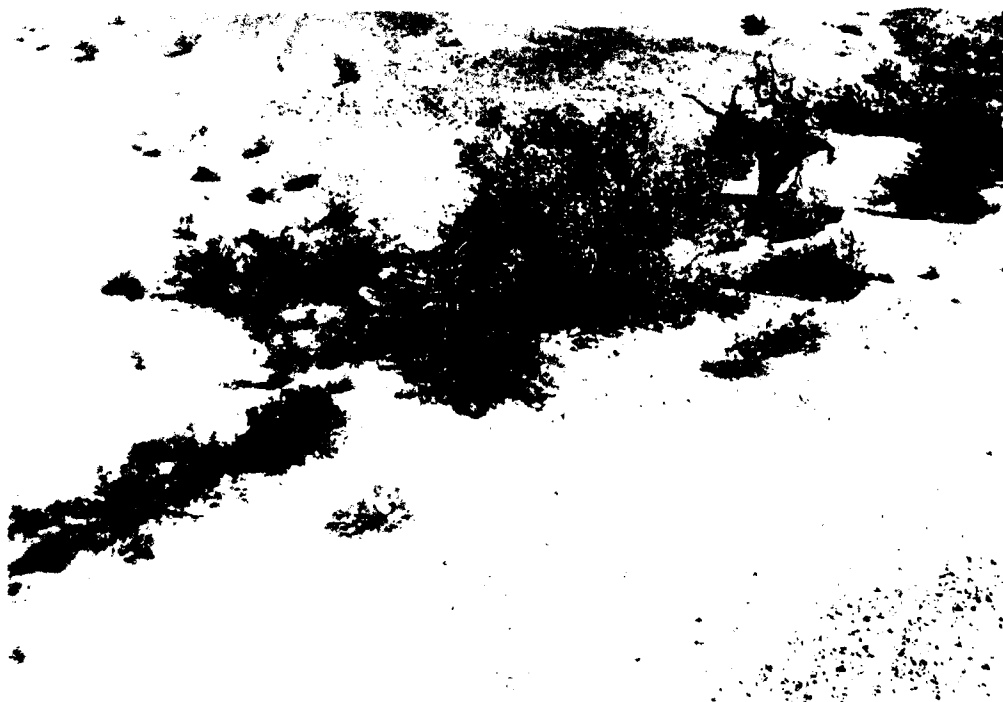


Figure E7. Scene 7, 14 deg





Figure E8 Scene 8, 10 deg



Figure E9 Scene 9, 10 deg

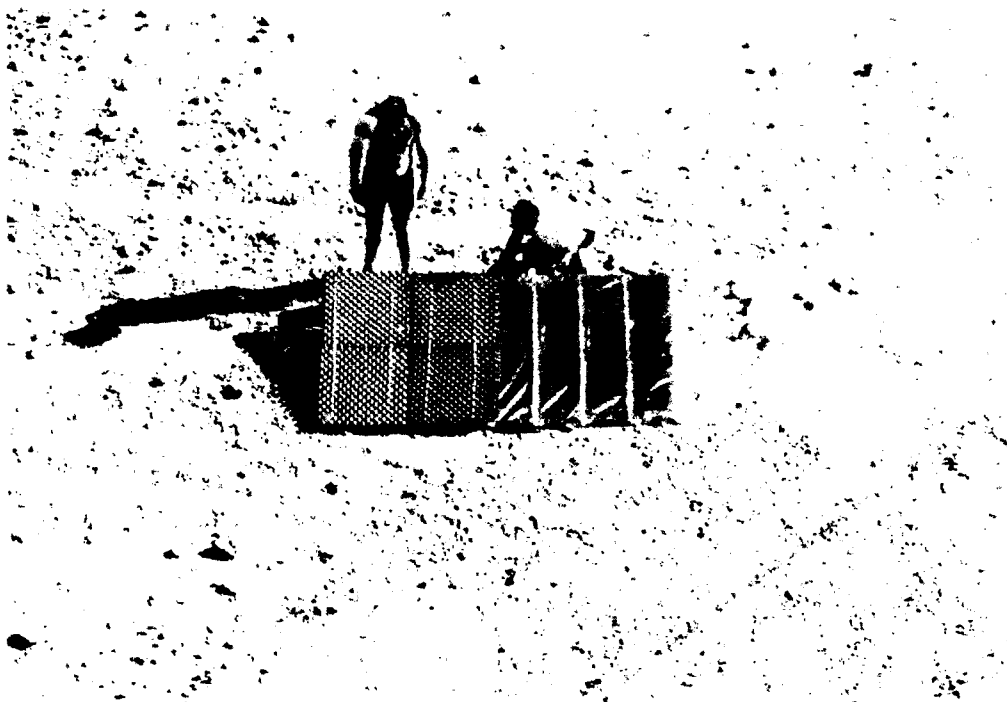


Figure E10 Scene 10, NRL calibration panels, 34 deg

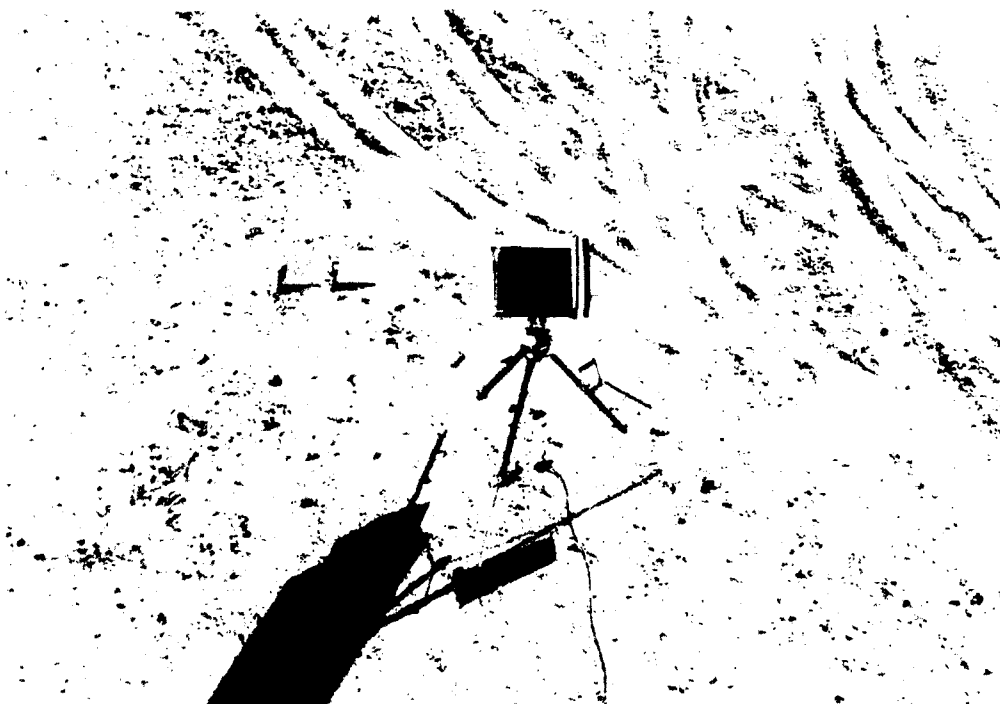


Figure E11 Scene 11, infrared calibration devices, 30 deg

## **Appendix F**

### **Spot Measurement**

### **Thermal Infrared Data**

---

The following photographs show the terrain features toward which the staring radiometers were pointed during spot measurements of thermal infrared signatures collected at Yuma Proving Ground, AZ, in September 1990. Also included in this Appendix is a tabulation of the 15-min averages of the apparent temperatures measured by each of the radiometers.

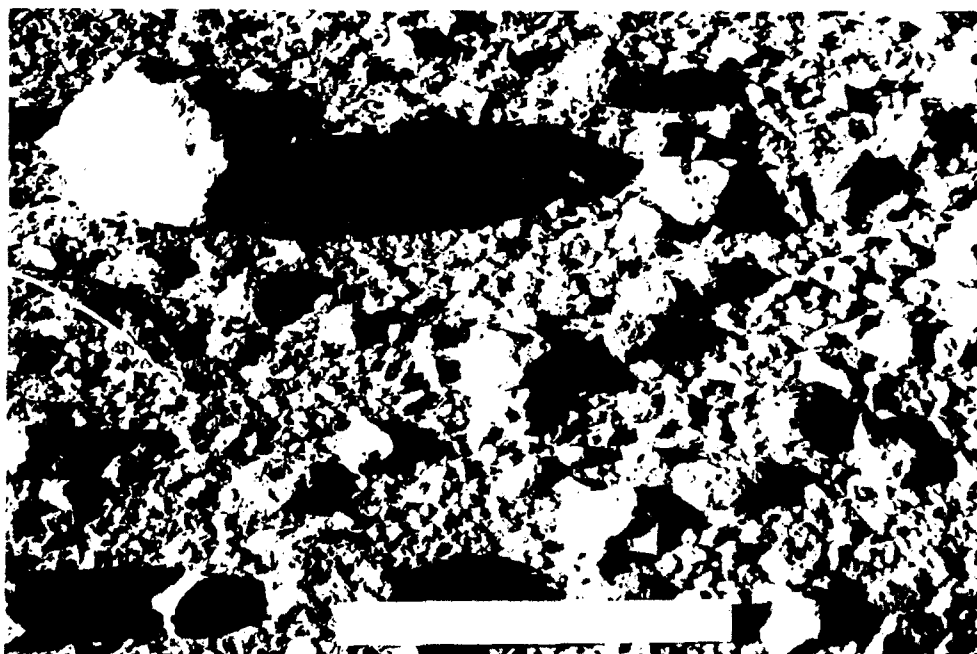


Figure F1. Radiometer 1, desert pavement

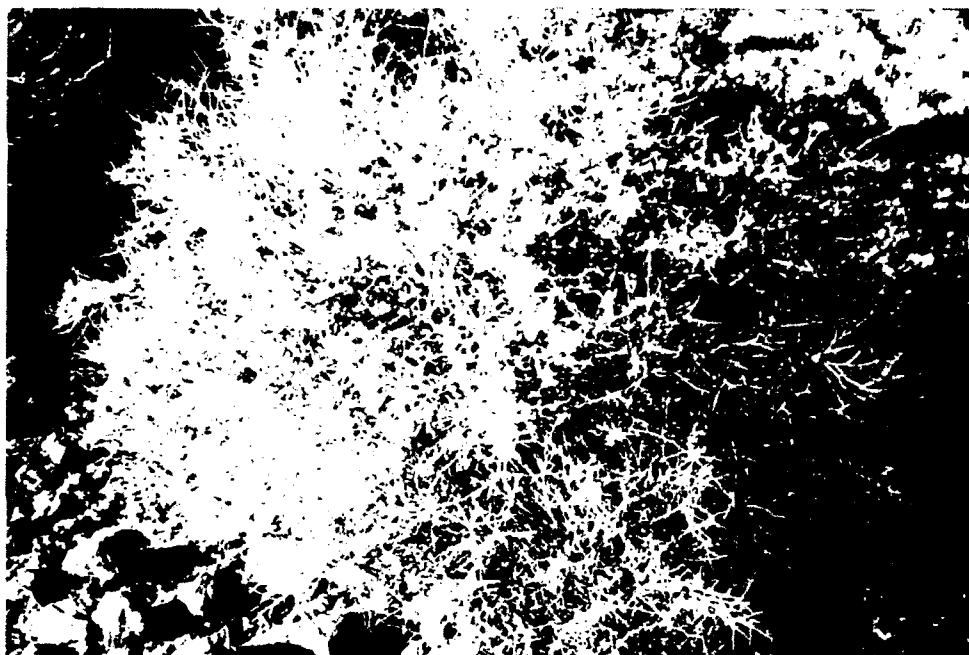


Figure F2. Radiometer 2, vegetation species AMDU

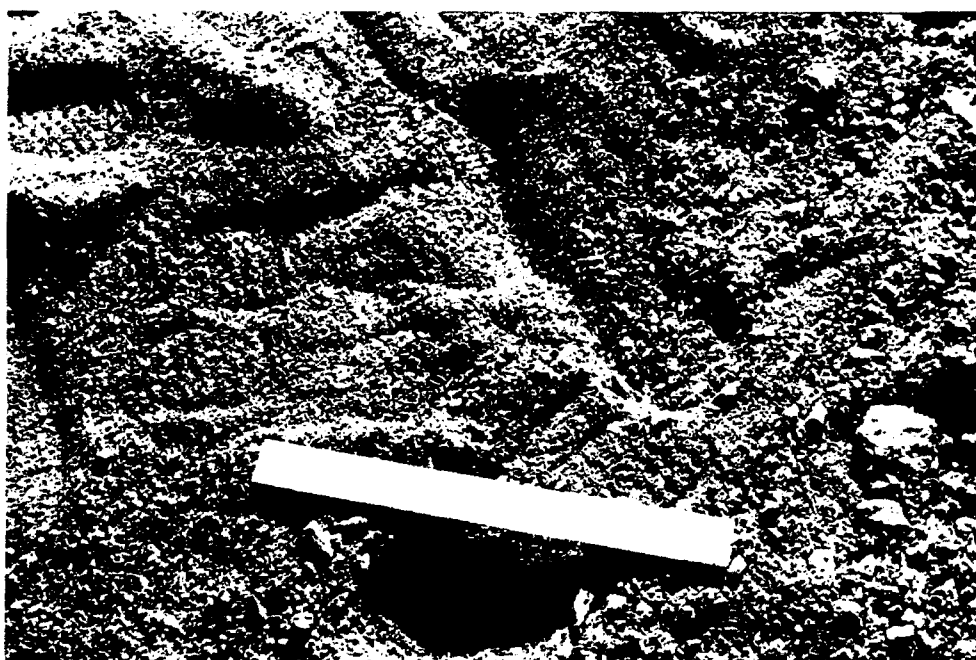


Figure F3. Radiometer 3, gravelly sand in wash bottom

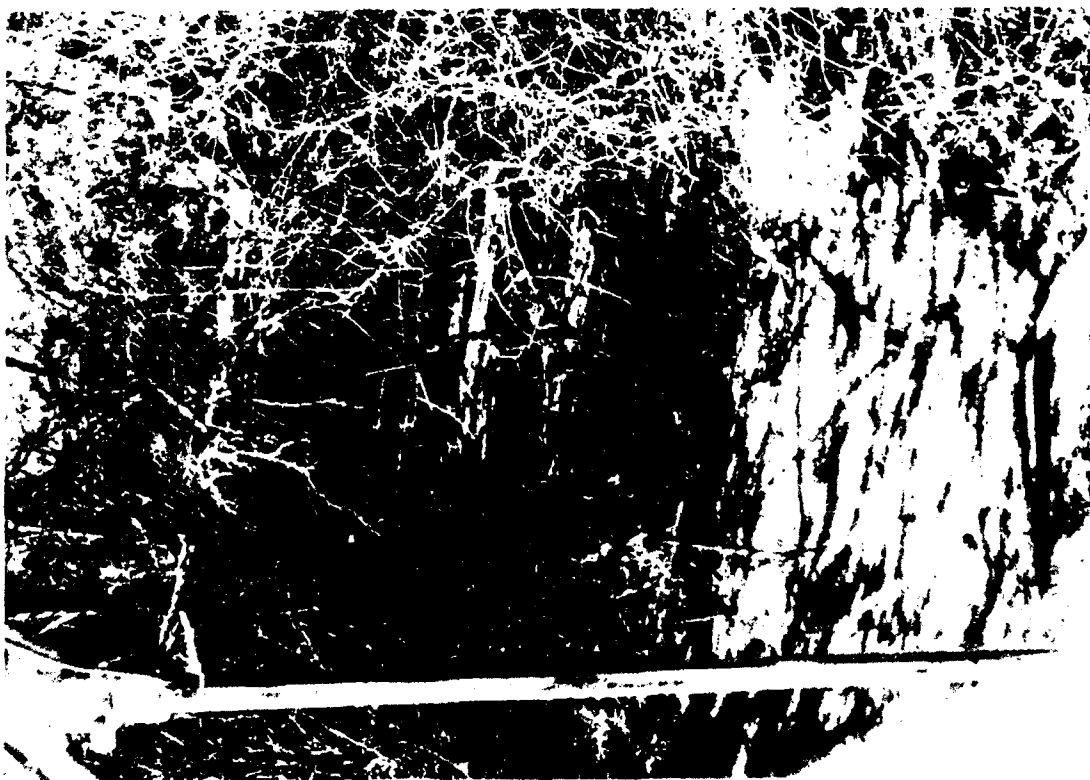


Figure F4. Radiometer 4, shaded soil on north bank of wash

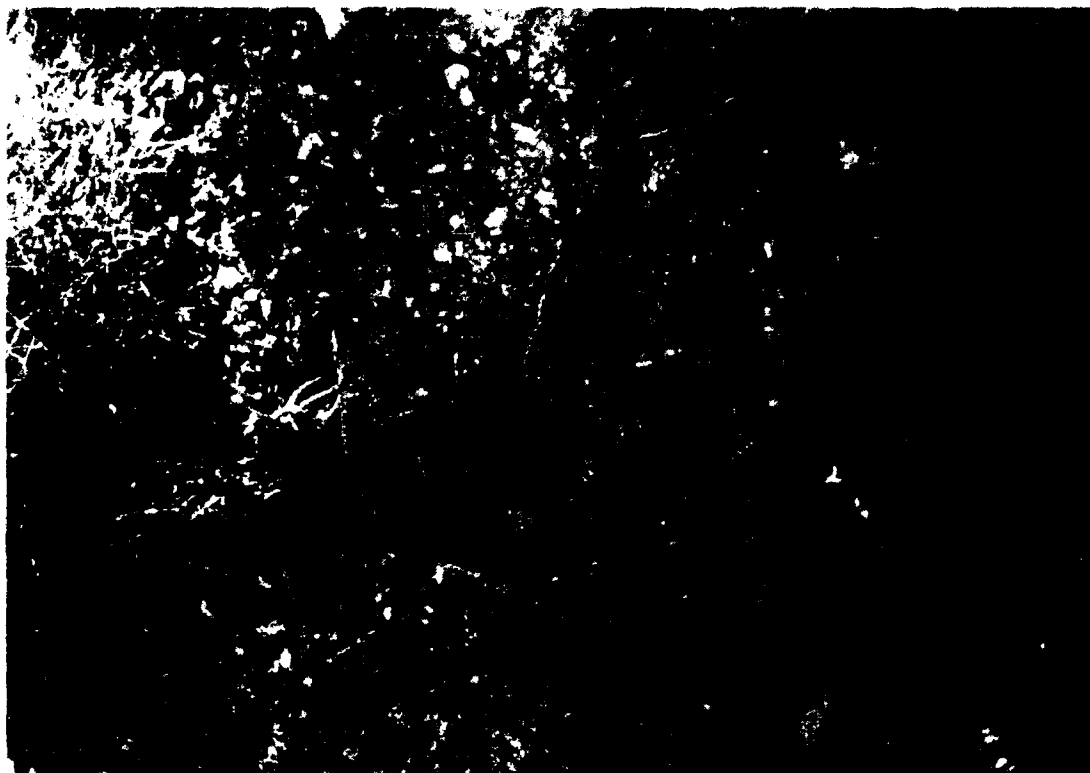


Figure F5. Radiometer 5, north-facing bank of wash

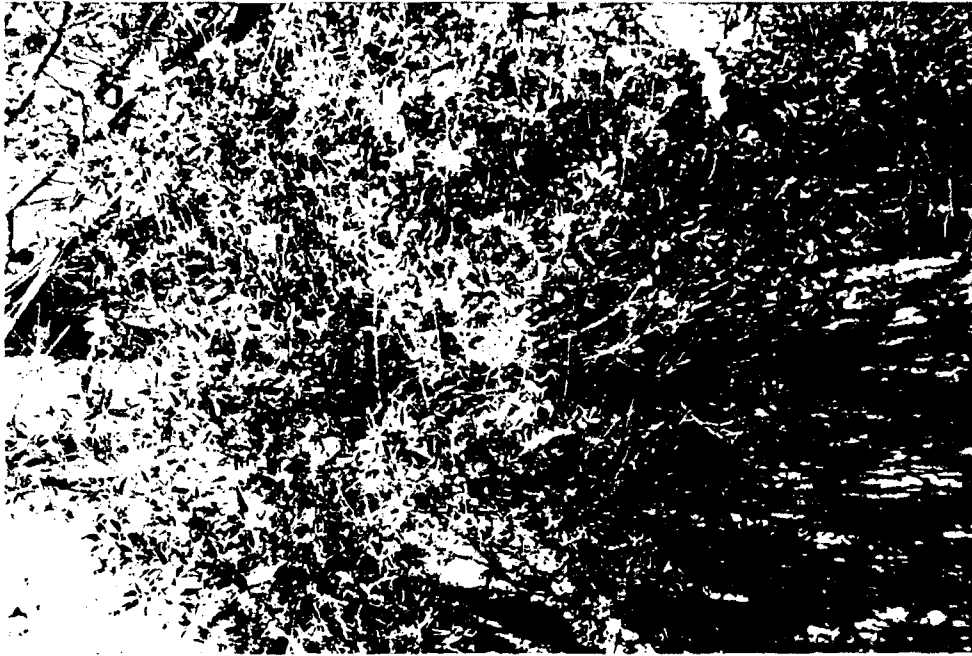


Figure F6. Radiometer 6, vegetation species ENFA



Figure F7. Radiometer 7, bush at base of tree, looking east, later pointed toward silty bank soil



Figure F8. Radiometer 8, south-facing deadwood

1

18sep90rad

92/03/12  
15:48:21

RADIOMETER DATA WASH PROFILE SANDHAM ENVIRONMENTAL AREA 18 SEP 1990													
TIME	RAD 1	RAD 2	RAD 3	RAD 4	RAD 5	RAD 6	RAD 7	RAD 8	deg c	deg c	deg c	deg c	deg c
1400	50.0	38.9	57.5	39.7	34.4	41.5	38.6	46.3					
1415	49.6	38.8	58.6	39.7	34.5	40.8	38.6	45.7					
1430	49.3	38.7	58.0	38.6	34.5	39.6	38.5	44.3					
1445	48.8	38.1	57.5	37.1	34.3	39.0	38.6	43.3					
1500	48.1	38.2	56.3	35.8	34.5	38.3	38.9	42.2					
1515	47.3	38.3	55.2	35.5	34.6	37.7	38.9	42.1					
1530	46.4	38.0	54.2	35.2	34.6	36.8	38.7	40.4					
1545	44.8	37.3	51.5	34.4	34.2	36.2	38.0	37.9					
1600	43.2	37.0	49.6	34.3	34.0	35.7	37.6	37.0					
1615	42.0	36.6	47.8	33.7	33.9	34.9	37.3	36.0					
1630	40.8	36.1	46.3	33.5	33.8	34.3	37.1	35.6					
1645	40.0	35.7	45.2	32.9	33.5	33.3	37.0	35.3					
1700	38.6	35.2	43.0	32.2	33.1	32.6	36.6	34.5					
1715	37.0	34.6	40.3	31.4	32.6	31.7	35.6	33.7					
1730	35.6	34.1	38.3	30.8	32.4	30.8	35.1	33.1					
1745	34.2	33.3	36.5	30.1	32.0	29.9	34.4	32.4					
1800	32.1	32.4	33.3	29.4	31.3	28.9	33.3	31.4					
1815	30.3	31.2	30.8	28.7	30.8	28.0	32.2	30.4					
1830	29.0	30.1	28.9	27.8	29.9	27.0	30.8	29.2					
1845	27.9	28.6	27.4	26.9	28.7	26.3	29.3	28.4					
1900	26.9	27.1	26.0	26.4	27.7	25.5	27.9	27.7					
1915	26.1	26.6	25.0	25.6	27.0	24.9	27.0	26.3					
1930	25.6	25.0	24.1	25.0	25.8	24.2	25.7	25.4					
1945	24.7	23.9	23.3	24.4	24.7	23.5	24.6	24.3					
2000	23.9	22.1	22.6	23.7	23.3	22.9	23.3	23.3					
2015	23.3	21.5	22.0	23.1	22.7	22.4	22.6	22.7					
2030	22.8	21.2	21.5	22.8	22.4	22.1	22.2	22.2					
2045	22.3	21.1	21.0	22.6	22.3	21.8	22.0	21.8					
2100	21.9	20.4	20.6	22.1	21.5	21.4	21.3	21.3					
2115	21.5	19.9	20.1	21.6	20.9	21.0	20.8	20.8					
2130	21.3	21.8	19.9	21.7	22.0	20.9	21.8	20.9					
2145	21.3	21.9	19.7	22.0	22.6	21.0	22.1	21.3					
2200	20.9	21.0	19.4	22.1	22.4	20.6	22.4	21.7					
2215	20.6	21.4	19.4	22.5	23.9	21.1	23.7	22.4					
2230	20.4	21.2	18.0	22.2	23.1	20.3	21.0	21.9					
2245	20.1	20.1	18.6	21.7	21.7	20.7	21.7	20.7					
2300	19.6	19.7	17.9	21.2	20.4	20.1	19.7	20.0					
2315	19.3	18.7	17.8	20.4	20.1	19.4	19.7	19.5					
2330	19.3	20.6	18.0	20.9	21.7	19.6	21.3	20.3					
2345	19.0	19.0	18.6	20.3	20.0	19.2	19.8	19.5					
2400	19.2	21.5	18.1	21.0	22.5	19.6	22.0	20.4					



1

19sep90.rad

920312  
15-48-29

RADIOMETER DATA  
WASH PROFILE  
SADURN ENVIRONMENTAL AREA  
19 SEP 1990

TIME	RAD 1	RAD 2	RAD 3	RAD 4	RAD 5	RAD 6	RAD 7	RAD 8
hhmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	18.8	19.9	17.6	20.5	21.0	19.4	20.8	19.8
0030	18.4	18.3	17.1	19.9	19.4	18.8	19.2	18.9
0045	18.0	17.3	16.7	19.4	18.6	18.3	18.4	18.1
0100	17.7	17.1	16.3	19.0	18.2	18.0	18.0	17.8
0115	17.4	16.0	16.4	19.0	18.0	18.1	18.8	17.8
0130	17.4	18.7	16.5	19.2	19.7	18.2	19.4	18.2
0145	17.2	18.3	16.4	19.2	19.6	18.1	19.2	18.1
0200	17.0	17.1	15.9	18.7	18.1	17.7	18.0	17.4
0215	16.8	16.5	15.6	18.4	17.3	17.3	17.3	16.9
0230	16.6	16.1	15.4	18.1	17.1	17.1	17.1	16.7
0245	16.4	16.9	15.6	18.3	18.2	17.2	18.2	17.6
0300	16.4	17.7	15.5	18.4	18.3	17.4	18.2	17.0
0315	16.1	16.3	15.1	17.0	17.1	16.9	17.0	16.5
0330	15.9	16.0	14.9	17.9	17.2	16.8	17.1	16.2
0345	15.8	16.5	14.9	17.9	17.4	16.8	17.1	16.4
0400	15.7	15.7	14.7	17.7	17.0	16.5	16.3	16.1
0415	15.6	17.0	14.8	17.7	17.8	16.7	17.3	16.3
0430	15.3	16.9	14.7	17.7	17.8	16.7	17.3	16.1
0445	15.2	16.7	14.5	17.7	17.4	16.5	16.4	15.8
0500	15.1	16.2	14.3	17.4	16.4	16.3	16.4	15.6
0515	15.1	15.2	14.3	17.2	16.4	16.1	16.3	15.6
0530	15.1	16.2	14.4	17.4	17.1	16.3	16.9	15.7
0545	15.1	16.5	14.3	17.2	16.4	16.1	16.3	15.6
0600	15.0	16.5	14.5	17.3	17.4	16.3	17.1	15.9
0615	15.0	16.8	14.6	17.3	17.5	16.4	17.4	16.1
0630	15.1	16.7	14.7	17.5	17.6	16.4	17.4	16.2
0645	15.4	17.5	14.9	17.9	18.1	16.9	17.9	17.0
0700	15.8	18.3	15.3	18.4	18.0	18.0	18.1	18.1
0715	16.6	20.3	16.0	19.0	19.5	20.8	19.3	19.7
0730	18.1	21.8	17.6	20.0	21.4	23.1	21.2	21.5
0745	21.1	23.3	19.5	21.5	22.6	26.1	23.7	23.6
0800	22.4	23.9	20.6	21.5	22.8	27.2	23.1	24.3
0815	24.8	25.1	23.4	22.5	23.6	29.1	24.0	25.6
0830	27.2	26.7	25.7	23.7	24.9	30.8	25.4	27.1
0845	29.4	28.1	30.1	25.2	26.3	31.9	26.8	28.4
0900	30.9	28.7	32.7	25.8	26.8	32.6	27.3	29.0
0915	32.7	29.2	35.4	26.7	27.3	34.1	27.6	29.6
0930	34.7	30.0	38.7	27.7	28.0	36.5	28.0	30.5
0945	36.8	30.9	41.4	29.0	28.6	38.4	28.4	31.8
1000	38.5	31.5	43.8	30.2	28.9	39.7	28.9	32.1
1015	40.0	32.2	46.0	32.1	29.4	40.9	29.6	32.8
1030	41.4	32.0	47.9	34.6	30.1	41.3	30.7	34.0
1045	41.5	32.8	50.8	36.5	30.6	42.9	31.6	36.8
1100	41.5	33.8	50.8	38.5	30.6	42.9	31.6	36.8
1115	41.8	34.4	51.1	39.5	30.6	43.0	31.9	38.2
1130	45.2	34.7	53.1	41.1	31.1	43.4	32.1	40.0
1145	45.9	35.1	53.9	41.4	31.3	43.5	32.9	40.5
1200	46.4	35.6	54.3	42.0	31.4	43.6	33.3	41.5
1215	47.5	36.0	55.8	42.7	31.4	43.4	34.0	43.8
1230	48.2	36.0	56.7	42.3	31.2	43.9	34.0	43.4
1245	48.8	36.7	57.5	42.3	31.8	44.0	35.2	44.2
1300	48.6	36.7	57.2	41.8	31.9	43.5	35.2	44.2
1315	48.6	36.9	57.4	41.2	32.6	42.8	35.9	44.6
1330	49.3	37.2	57.6	41.0	33.1	42.3	37.0	45.3
1345	48.8	37.2	57.1	40.2	33.4	42.8	36.4	43.4
1400	49.8	37.6	58.2	40.3	33.3	41.5	37.2	46.2

1415	48.4	36.6	55.8	38.7	32.9	40.5	36.5	43.8
1430	48.7	37.1	56.2	38.0	32.9	40.5	37.3	43.9
1445	45.3	35.3	50.3	36.0	32.8	39.2	35.1	39.5
1500	47.7	37.4	54.5	36.7	32.8	39.7	37.4	41.5
1515	47.4	36.7	53.1	36.1	33.5	39.1	36.7	40.3
1530	48.1	35.1	53.1	37.3	33.3	37.3	36.3	38.7
1545	48.7	38.0	50.9	37.3	36.8	36.2	37.4	
1600	43.6	35.4	48.6	34.7	32.9	35.9	35.9	36.6
1615	42.6	32.6	45.0	34.1	32.9	35.3	35.6	35.5
1630	41.0	32.0	44.5	32.9	32.3	34.4	35.0	35.0
1645	38.3	31.9	41.9	32.2	32.0	33.5	34.5	34.0
1700	38.2	33.4	39.2	31.4	31.7	32.5	33.9	33.1
1715	36.6	32.6	37.2	30.6	31.1	31.6	33.1	32.3
1730	35.8	32.3	35.4	30.0	31.0	30.7	32.8	31.8
1745	31.8	32.3	32.7	29.3	30.5	29.6	31.9	30.8
1800	31.9	31.3	32.7	28.6	30.3	28.7	31.0	29.9
1815	30.9	30.5	30.6	28.6	30.3	28.7	30.3	29.2
1830	28.3	30.0	28.1	28.0	29.9	27.8	30.3	28.7
1845	28.3	29.5	27.9	27.6	29.6	27.0	29.2	28.0
1900	27.3	28.9	26.8	27.0	29.1	26.2	29.2	28.5
1915	26.5	28.3	25.8	26.6	28.8	25.5	28.5	27.5
1930	25.9	27.6	25.0	26.1	28.1	24.9	28.0	26.8
1945	25.2	27.0	24.1	25.6	27.4	24.3	27.4	26.2
2000	24.6	26.5	23.6	25.3	27.1	23.9	27.1	25.9
2015	24.0	25.0	22.9	24.7	25.9	23.4	25.9	24.9
2030	23.2	21.9	21.9	23.4	23.3	22.6	23.2	23.1
2045	22.5	20.6	21.2	22.6	21.7	21.9	21.6	22.1
2100	21.9	20.2	20.6	22.1	21.1	21.5	21.1	21.4
2115	21.4	20.0	20.0	21.8	21.0	21.0	21.0	20.9
2130	20.9	19.4	19.6	21.4	20.6	20.7	20.4	20.5
2145	20.5	19.4	19.2	21.0	20.3	20.3	20.1	20.0
2200	20.5	22.0	19.3	21.7	21.0	20.5	22.5	20.9
2215	20.3	20.9	19.0	21.4	21.9	20.4	21.6	20.6
2230	20.1	20.7	18.7	21.3	21.5	20.2	21.3	20.5
2245	20.2	22.1	18.8	21.5	22.6	20.4	22.8	21.2
2300	20.2	22.1	18.9	21.6	22.7	20.6	23.0	21.4
2315	20.0	20.6	18.7	21.4	21.6	20.3	21.7	21.0
2330	19.9	20.4	18.6	21.0	21.0	20.0	21.1	20.6
2345	20.4	21.7	19.2	21.6	22.3	20.6	22.6	21.4
2400	20.2	20.5	19.0	21.4	21.6	20.5	21.5	20.9

1

92/01/12  
15:58:05

20sep90.rad

RADIOMETER DATA  
WASH PROFILE  
SADARM ENVIRONMENTAL AREA  
20 SEP 1990

TIME	RAD 1	RAD 2	RAD 3	RAD 4	RAD 5	RAD 6	RAD 7	RAD 8
hhmm	deg c	deg c	deg c	deg c	deg c	deg c	deg c	deg c
0015	19.8	19.5	18.7	21.0	20.6	20.1	20.7	20.4
0030	19.5	19.5	18.5	20.6	20.3	19.9	20.3	20.1
0045	19.4	20.0	18.4	20.7	20.8	19.9	20.6	20.2
0100	19.1	19.1	18.1	20.5	20.0	19.6	19.9	19.8
0115	18.8	18.4	17.8	20.0	19.8	19.3	19.5	19.2
0130	18.6	18.3	17.6	19.8	19.2	19.1	19.1	18.9
0145	18.4	18.5	17.4	19.7	19.5	19.0	19.3	18.8
0200	18.3	19.2	17.5	19.8	20.0	19.0	19.8	19.0
0215	18.2	18.7	17.4	19.7	19.4	18.9	19.3	18.9
0230	18.1	18.6	17.2	19.7	19.5	18.8	19.3	18.6
0245	17.9	18.7	17.0	19.6	19.3	18.8	19.1	18.6
0300	17.7	17.7	16.7	19.3	18.6	18.4	18.6	18.4
0315	17.5	18.1	16.6	19.2	18.8	18.2	18.8	18.2
0330	17.3	17.7	16.4	19.2	18.7	18.1	18.4	18.1
0345	17.2	18.5	16.5	19.1	19.3	18.2	18.9	18.4
0400	17.2	18.9	16.6	19.1	19.5	18.3	19.3	18.6
0415	17.0	18.3	16.5	19.0	18.9	18.1	18.9	18.1
0430	16.9	18.7	16.4	19.0	19.0	18.1	19.0	18.2
0445	16.7	18.1	16.1	18.8	18.6	17.9	18.5	17.7
0500	16.5	17.9	16.1	18.6	18.6	17.7	18.7	17.7
0515	16.4	18.1	16.0	18.7	18.7	17.7	18.7	17.7
0530	16.4	18.3	16.2	18.8	19.0	17.8	18.9	18.0
0545	16.4	18.2	16.2	18.8	18.8	17.7	18.6	17.8
0600	16.4	18.3	16.2	18.7	18.8	17.7	18.8	17.8
0615	16.7	18.7	16.5	19.0	19.3	18.2	19.2	18.3
0630	16.9	18.9	16.7	19.1	19.2	18.3	19.2	18.5
0645	17.0	19.6	16.8	19.1	19.2	18.4	19.1	18.3
0700	17.9	19.6	17.9	19.7	19.9	19.2	20.1	19.3
0715	19.3	20.7	19.5	20.7	20.9	20.2	21.1	20.5
0730	20.0	21.2	20.3	21.2	21.2	20.9	21.7	21.2
0745	20.9	22.0	21.1	21.6	21.6	21.7	22.4	22.0
0800	21.5	22.2	22.7	22.9	22.7	22.7	23.4	23.2
0815	23.9	24.6	24.2	23.9	23.9	24.7	24.5	24.6
0830	26.3	26.3	26.7	24.8	24.9	27.1	25.7	24.6
0845	28.9	28.3	27.4	25.1	24.7	27.7	26.1	27.0
0900	28.4	27.8	27.3	25.8	25.2	29.3	26.8	27.8
0915	30.2	27.8	27.8	26.7	25.9	31.2	28.2	29.0
0930	34.3	30.2	37.5	28.2	27.8	35.1	28.4	31.4
0945	35.9	31.0	39.5	29.6	28.6	36.1	30.1	32.5
1000	37.6	31.8	42.0	31.1	29.3	37.1	31.7	32.3
1015	39.3	32.7	44.0	32.7	29.6	38.7	34.8	34.0
1030	41.0	33.2	46.2	35.7	30.5	39.6	35.8	35.2
1045	40.8	31.0	44.2	36.8	30.2	39.8	36.8	35.7
1100	40.6	32.7	46.0	37.8	30.1	37.9	36.8	36.3
1115	42.7	34.0	48.8	39.6	30.8	38.6	38.6	38.9
1130	42.2	34.0	47.8	39.3	30.8	38.2	38.2	38.8
1145	43.5	33.8	50.0	41.3	30.9	39.0	39.0	39.0
1200	44.2	34.6	50.8	40.8	31.1	39.7	39.7	40.3
1215	45.3	35.5	52.6	41.6	31.4	40.5	39.8	42.9
1230	45.7	35.7	53.3	41.2	31.4	40.2	39.8	43.0
1245	47.6	36.0	56.1	43.5	31.6	41.8	39.8	45.7
1300	48.7	36.4	57.2	43.7	32.2	40.3	39.8	45.7
1315	48.2	36.2	56.2	42.0	32.9	40.3	39.8	45.1
1330	48.6	36.2	56.5	41.0	32.1	39.3	39.8	45.1
1345	48.3	36.5	56.2	40.7	32.5	38.9	39.8	45.4
1400	47.5	36.0	54.6	39.5	32.6	37.4	39.8	43.9

REMARKS: MSG = Missing

1415	46.8	35.6	54.4	39.0	32.6	36.4	MSG	43.1
1430	46.3	38.0	53.7	37.6	32.6	36.8	MSG	41.2
1445	45.5	35.4	51.5	36.5	31.9	36.1	MSG	41.0
1500	43.7	34.5	49.1	35.7	31.4	35.5	MSG	39.5
1515	44.2	35.2	49.7	35.8	31.6	36.5	MSG	40.0
1530	47.8	38.2	55.2	37.1	31.0	37.2	MSG	42.0
1545	47.5	38.0	54.0	35.7	31.3	37.1	MSG	39.4
1600	46.2	35.8	52.1	34.9	31.5	35.8	MSG	39.4
1615	44.8	34.9	50.2	34.1	31.9	34.7	MSG	38.4
1630	43.6	34.4	47.9	33.1	31.3	34.1	MSG	37.2
1645	42.2	34.5	46.5	32.7	31.8	32.6	MSG	34.5
1700	39.6	34.1	43.0	31.9	31.8	32.6	MSG	34.5
1715	37.7	33.4	40.7	31.2	31.3	31.6	MSG	33.7
1730	36.2	33.1	38.6	30.8	31.4	31.0	MSG	33.0
1745	34.3	32.3	36.1	30.3	31.0	30.3	32.3	32.1
1800	32.3	31.4	33.4	29.6	30.1	28.4	29.0	30.1
1815	30.6	30.5	30.9	29.0	29.1	28.4	28.0	30.1
1830	30.4	30.1	30.2	28.9	28.9	28.3	28.0	29.6
1845	29.5	29.4	29.1	28.6	28.5	28.1	28.1	29.5
1900	28.8	29.1	28.4	28.1	28.5	28.4	28.1	29.1
1915	28.5	28.7	27.8	27.6	28.0	27.5	27.6	28.7
1930	28.4	28.4	27.8	27.6	28.0	27.5	27.6	28.4
1945	28.4	28.3	27.8	27.6	28.0	27.5	27.6	28.4
2000	27.5	27.6	26.8	27.2	27.6	27.1	27.1	28.0
2015	26.7	27.3	26.1	26.8	27.2	26.8	27.3	28.1
2030	26.1	26.9	25.3	26.4	27.5	26.7	26.7	27.3
2045	25.6	26.6	24.7	26.0	27.2	26.3	26.9	26.2
2060	24.9	26.0	24.0	25.3	26.7	26.7	26.7	26.2
2115	24.0	25.0	23.1	24.8	26.2	24.8	24.3	25.6
2130	23.8	24.9	23.1	24.5	25.6	23.7	23.2	24.4
2145	22.9	24.1	22.1	23.6	24.7	23.2	23.4	23.6
2200	21.9	23.4	21.0	22.9	24.1	22.5	21.4	22.9
2215	21.5	23.4	20.8	23.0	24.2	23.0	21.3	23.7
2230	21.1	22.8	20.4	22.7	23.6	21.6	20.9	22.2
2245	20.7	22.3	19.8	22.1	23.0	21.4	20.5	22.0
2300	20.4	22.3	19.2	22.2	23.2	21.3	20.3	21.8
2315	20.1	21.8	19.2	21.9	23.4	21.9	20.0	21.2
2330	19.9	21.6	19.1	21.6	23.4	21.6	19.6	21.0
2345	19.8	21.7	18.9	21.4	23.4	21.4	19.7	21.1
2400	19.4	21.3	18.6	21.0	21.9	20.4	19.5	20.8

1

21sep90.rad

2203/12  
15:49:01

RADIOMETER DATA									
WATER PROFILE									
SADAM ENVIRONMENTAL AREA									
21 SEP 1990									
TIME	RAD 1	RAD 2	RAD 3	RAD 4	RAD 5	RAD 6	RAD 7	RAD 8	
hum	deg c	deg c	deg c	deg c	deg c	deg c	deg c	deg c	
0015	19.4	21.0	18.5	20.8	21.6	20.2	19.3	20.6	
0030	19.4	21.3	18.5	20.8	21.7	20.3	19.3	20.6	
0045	19.5	21.4	18.6	21.0	21.9	20.5	19.5	21.1	
0100	19.6	21.5	18.7	21.1	22.0	20.6	19.7	21.1	
0115	19.6	21.5	18.7	21.1	22.0	20.6	19.7	21.1	
0130	19.5	21.3	18.5	21.1	21.8	20.5	19.6	21.1	
0145	19.4	21.2	18.4	21.0	21.7	20.4	19.5	21.0	
0200	19.3	21.1	18.3	21.0	21.6	20.4	19.4	21.0	
0215	19.2	21.0	18.2	20.9	21.5	20.3	19.3	20.8	
0230	19.2	21.0	18.2	20.9	21.5	20.3	19.3	20.8	
0245	19.2	21.0	18.2	20.9	21.5	20.3	19.3	20.8	
0300	19.1	20.9	18.1	20.8	21.4	20.2	19.2	20.7	
0315	19.0	20.8	18.0	20.7	21.3	20.1	19.1	20.6	
0330	18.9	20.7	17.9	20.6	21.2	20.0	19.0	20.5	
0345	18.8	20.6	17.8	20.5	21.1	19.9	18.9	20.4	
0400	18.6	20.4	17.6	20.3	21.0	19.8	18.7	20.3	
0415	18.5	20.3	17.5	20.2	20.9	19.7	18.6	20.2	
0430	18.5	20.3	17.5	20.2	20.9	19.7	18.6	20.2	
0445	18.4	20.2	17.4	20.1	20.8	19.6	18.5	20.1	
0500	18.3	20.1	17.3	20.0	20.7	19.5	18.4	20.0	
0515	18.2	20.0	17.2	19.9	20.6	19.4	18.3	19.9	
0530	18.1	19.9	17.1	19.8	20.5	19.3	18.2	19.8	
0545	18.1	19.9	17.1	19.8	20.5	19.3	18.2	19.8	
0600	18.1	19.9	17.1	19.8	20.5	19.3	18.2	19.8	

**REPORT DOCUMENTATION PAGE**Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

<b>1. AGENCY USE ONLY (Leave blank)</b>		<b>2. REPORT DATE</b> May 1993	<b>3. REPORT TYPE AND DATES COVERED</b> Final report	
<b>4. TITLE AND SUBTITLE</b> Environmental Characterization for the Sense and Destroy Armor (SADARM) Captive Flight Test, U.S. Army Yuma Proving Ground, Arizona			<b>5. FUNDING NUMBERS</b>	
<b>6. AUTHOR(S)</b> John O. Curtis, Flynn A. Clark, Frank E. Perron, Jr., John E. Fiori, Bryan G. Harrington, Stephen N. Decato				
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> U.S. Army Engineer Waterways Experiment Station, Environmental Laboratory, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199; Cold Regions Research and Engineering Laboratory, Corps of Engineers, Hanover, NH 03755-1290			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>  Miscellaneous Paper EL-93-5	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Department of the Army, Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, NJ 07806-5000			<b>10. SPONSORING / MONITORING AGENCY REPORT NUMBER</b>	
<b>11. SUPPLEMENTARY NOTES</b> Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.				
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited.			<b>12b. DISTRIBUTION CODE</b>	
<b>13. ABSTRACT (Maximum 200 words)</b>  This report provides an outline of the test site environmental characterization support completed at the U.S. Army Yuma Proving Ground for the Sense and Destroy Armor (SADARM) Captive Flight Test conducted during September 1990. Personnel from two U.S. Army Corps of Engineers laboratories, the U.S. Army Engineer Waterways Experiment Station and the Cold Regions Research and Engineering Laboratory, collected data during a 2-week period to both qualitatively and quantitatively define the ambient desert terrain and meteorological conditions that provide the background signatures for the SADARM system. Information collected included that necessary to assess the boundary layer radiation exchange process, the characteristics of the ground surface, and the characteristics of the vegetation present in this arid environment. A fixed tower was erected adjacent to a representative patch of desert terrain to provide a platform from which both static and dynamic processes could be observed. Sensors used to view the representative environmental plot included thermal imaging systems that operated in both the 3- to 5- $\mu$ m and 8- to 12- $\mu$ m wavelength bands, an active millimeter wave system that swept a frequency band of 33.0 to 33.5 GHz, and two scanning radiometers operated by the Naval Research Laboratory.				
<b>14. SUBJECT TERMS</b> Desert terrain Environmental characterization Infrared imagery			Meteorology Radar backscatter Vegetation	<b>15. NUMBER OF PAGES</b> 130
				<b>16. PRICE CODE</b>
<b>17. SECURITY CLASSIFICATION OF REPORT</b> UNCLASSIFIED	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> UNCLASSIFIED	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b>	<b>20. LIMITATION OF ABSTRACT</b>	